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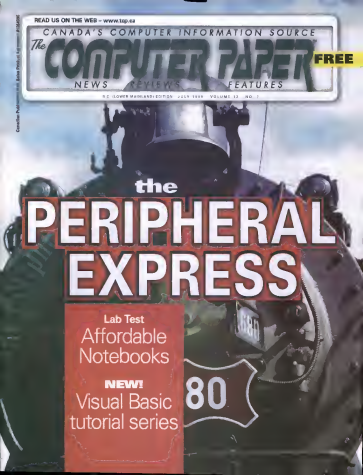

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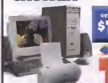

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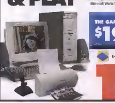

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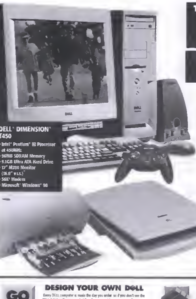

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THE COMPUTER PAPER
Volume 12, No. 7, July 1999

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Legacy-free computing

In an effort to tell business customers that there will be computing life in the years ahead, Intel Canada recently held an After Midnight event—referring to midnight on Dec. 31 1999 Specifics about computing life in early 2000 and the potential messiness of unresolved Year 2000 (Y2K) issues were neatly avoided. Instead the company presented an entertaining scenario about computing in some indeterminate future time

FROM THE EDITOR

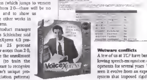
According to the presentation, desktop computing will occur in a seamless web of multimedia connections to people and data located anywhere. Voice will be the primary method for data input and computer command and control, video conferencing and audio- and video-enhanced email are givens

Intel's vision showed the computer screen interface as a series of multifaceted info-globes, that looked like translucent soccer balls. The globes were the equivalent of directories or folders while the facets represented individual files, whether data database queries, video conference sessions or contact information Queries, searches and complex data manipulations were handled by intelligent agents represented by little cartoon critters that zoomed off to find the information thei users requested.

Interestingly, another Intel project, which will likely have more immediate impact, was mentioned only in passing. At the front of the presentation theatre was Intel's Twister prototype, a small computer, about the size of two shoe boxes The Twister is what Intel calls a legacy-free platform, and is an example of what can be accomplished with the company's Flex ATX specification. Flex ATX, which was announced in February, offers designers some flexibility in the physical design of PCs "Legacy free" refers to the fact that Twister has no ISA bus and the only external ports are USB (universal serial bus) and IEEE 1394, or FireWire. However, the Twister is still a personal computer as we currently define it, with an Intel Pentium III processor, RAM, a hard drive, and, presumably, a Windows operating system Think of it as the Wintel version of an iMac Some manufactures are quite interested in this concept, and we may be able to buy a Twister-type PC by Christmas.

Sweet talk

The central role voice plays in Intel's vision of the future is not surprising. Many in the computer industry think voice-enabled computing will be the next killer app Coincidentally, a couple of days after the Intel presentation representatives from speech software developer Lernout and Hauspie (L&H) dropped by the office to preview the latest version of its speech recognition product, Voice Xpress (which jumps to version 4.0 from 2.0—there will be no 3.0), and to show us some other works in progress.



Product manager Klaus Schleicher said VoiceXpress 4.0 produces 25 percent fewer errors than 2.0, while the enrollment time (to train the software to recognize a user's unique pronunciation patterns) has been reduced to just 10 minutes This latter development is quite dramatic—earlier versions of VoiceXpress, as well as competing products like IBM's ViaVoice and Dragon Systems' Naturally Speaking, require an hour or more.

L&H also demonstrated a new text-to-speech engine, which reduces the metallic quality of synthesized speech and makes it sound more like a human voice. Watching text turned into speech for the first time can be a bit spooky: you highlight a passage, start the engine, and actually hear the computer "read" the text (or a group of spreadsheet numbers) through its speakers.

In May, Intel and L&H announced a joint venture to develop e-commerce and telephony products. One of the L&H technologies that will be explored in this venture is the text-to-speech engine Some day soon, that voice you hear at the other end of the line telling you to have a good day may be entirely synthetic

Another trend highlighted by the L&H folks was on-the-go dictation The company has introduced a mobile product than combines an Olympus digital voice recorder with VoiceXpress software. This type of product was pioneered by IBM and Olympus, who last year announced essentially the same thing, except that the Olympus recorder was paired with IBM ViaVoice With both products you dictate into the digital recorder wherever you happen to find yourself, then later, download the voice file onto your computer and run it through the speech recognition software, which transcribes it into text.

Wetware conflicts

A few of us at *TCP* have been following speech-recognition developments for several years We've seen it evolve from an expensive system that imposed rigid rules on the user to its present state of being nearly ready to use as a general productivity tool However, even as the technology approaches this stage of development, widespread adoption may be hampered not by hardware or software, but by wetware—in other words, our own brains.

Communicating orally is different than communicating through print. The best way to demonstrate that is to record a conversation, and then transcribe it word for word. The resulting transcript would make an English teacher shudder. It would be full of grammatical mistakes and sentence fragments, and the compositional structure would be hard to follow. Yet as spoken dialogue the participants in the conversation have no trouble following the logic or understanding the meaning.

When you use a speech-recognition program it's not like conversation, but it's not like writing either. It requires a new sensibility between the creation of thought and its expression The technology can set the conditions to make it easier for us to use it, but it can't hasten our adoption—we'll embrace it in our own sweet time

Interesting times ahead,
David Tanaka Editor

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NOT ONLY ARE MICRO-GLITCH COMPUTERS READY FOR THE YEAR 2000 BY BEING Y2K COMPLIANT, BUT WE'RE ALSO Y3K-READY!
Y3K?
WELL, YOU DON'T WANT TO GO THROUGH ALL THESE TURN-OF-THE-MILLENIUM HASSLES AGAIN DO YOU?
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Gil Weiss © 1999

Wants to do acrobatic tricks

Every time I download a PDF file, the clarity and great style of the document is amazing. Graphics are downloaded inside a document without a problem. To say I'm impressed is an understatement. Is it possible to convert a WordPerfect 8 document into PDF? I would like to use it for tutorials and instructional documents.

Incidentally, I enjoy *TCP* immensely. keep up the good work.

Ron Hamilton

TCP *replies. PDF stands for portable document format, and we concur with you that it is a fine way to distribute documents with the formatting preserved. You can buy a program called Adobe Acrobat 4.0, which will allow you to convert your documents into PDF (Acrobat includes a number of other features too). We've seen it advertised for around $360.*

However, since you are a WordPerfect user, you will be happy to hear that WordPerfect Version 9, which is part of the recently released WordPerfect 2000 Suite, includes the ability to create PDF files. When you select "publish to PDF" in the File menu WordPerfect creates a separate PDF file from your document. We've tried this with text and simple graphics as part of our ongoing evaluation of the new WordPerfect suite and have found it works.

And speaking of Acrobat 4.0 . . .

I am a high school math/physics teacher and I work with a lot of PDF files that the ministry posts on the Web. Hence, I need to use Adobe Acrobat Reader a lot. I was happy to see that Adobe released the new Acrobat Reader 4.0 and I eagerly downloaded the program. Much to my disappointment, when I opened up the program I noticed that the Select Graphic tool icon is missing from the toolbar. I searched through all the pull-down menus and was unable to locate it. Did I miss something or did Adobe?

J. Wu

GB replies. The Select Graphic tool is there. It's a pop-up (or fly-out) tool hidden under the Select Text tool (notice the little triangle indicating a pop-up tool).

Who you callin' old?

My blood boils whenever I see those three letters "O-L-D" in front of 486. Now my 92-year-old grandmother is old! I used to drive a 1972 GM Camaro. That was old! I still have some of my college books. They are old!

But in the article "Surfin' all through the house" in your May issue you mention your "old 486 ThinkPad Butterfly subnotebook." Now, a computer that's five or six years "young" should not be called old. Why not say: My trusty 486, or my reliable 486, or my compact 486, or my convenient 486, or my robust 486, or my ... ?

Well, ... you get the picture. ;-)

Serge Desaulniers

DT replies: We've become used to seeing computer technology change so quickly that we don't think of it on the same time line as humans. Suppose computers age more like dogs do, with one doggie year (or computer year) equalling about seven human years. By that reckoning, that four-year old 486 is about the same vintage as your Camaro.

Cross-platform printing

I thought that I read a review in your paper about file sharing with Mac computers.

I am looking for a program which allows me (Pentium PC running Windows 95) to share files with my printing company that uses, I believe, a Power Mac System 7.5 (again I assume). Generally we would exchange PageMaker 6.5, Illustrator and Photoshop files or images.

Can you guide me in the direction where I could search for such programs?

Hart Sprenger

TCP *replies. The recent versions of the software you mention are file-compatible across Macs and Windows PCs. Moreover, a built-in feature of Macs allows them to read PC disks. So, in other words, if you created a file in PageMaker 6.5 for Windows and copied it to a floppy, you will be able to pop it into a Mac and open the file using PageMaker 6.5 for Macintosh.*

However, this isn't likely the biggest obstacle you'll encounter in establishing a good working relationship with your printer, or in ensuring that your print job comes out the way you want. Even though a Mac may be able to open those files, there are a few factors—the fonts you select or how you save the images, for example—that could throw a wrench in the works.

The best strategy is to find out from the printing company what its requirements are for preparing files. To use TCP as an example, many advertisers submit artwork for their ads to our production department. We provide an information sheet that covers the basics of preparing a

Continued on page **14**

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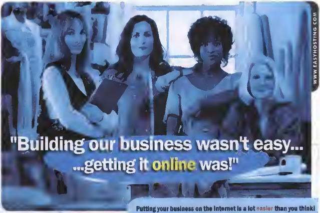
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[illegible]

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- 20 Configurable mail forwarding options
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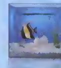

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Mask hole	Dot	Aperture Grille	Dot	Slot
Stripe (Dot) Pitch	0.28/0.30mm	0.25mm	0.25mm	0.24mm
Remarks	• Poor in light reflection • Liable to flowing (colour tone damaged) • Medium screen clearness	• Visible screen size: 40.6cm • ARAS coating • Left and right vertical shades • Better colour tones	• Visible screen size: 40.6cm • Hi-contrast AR coating • Left and right vertical shades	• Visible screen size: 40.7cm • Wide ARAS coating • Eye-friendly • Image distortion free

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WHAT'S NEW

Fuji MX-2700 offers 2.3 megapixels

Digital cameras have lagged behind film cameras in the maximum image resolution they can capture, but Fuji Photo Film of Canada Inc.'s MX-2700 is a fine example of how digital cameras are beginning to close the gap.

The camera will capture 1,800x1,200 pixel images, which Fuji says will produce a 4x6-inch print at 300 dots per inch (dpi), or an 8x12-inch print at 150 dpi. The company also claims the MX-2700 is the world's smallest two-million pixel camera. It measures 7.9x9.7x3.3 cm (3.1x3.8x1.3 in.) and weighs 240 g (8.5 oz) without battery. The Lithium Ion battery is good for about 250 shots before it needs recharging, or about a third that many if the LCD viewer is used.

The focal length of the lens is the equivalent of 35 mm on a 35 mm film camera, and an optical zoom offers up to 2x zooming. A macro mode allows objects to be as close as 8.9 cm (3.5 inches). Like other Fuji digital cameras, this model uses SmartMedia cards for image storage, and will accept 4 MB, 8 MB, 16 MB, and the latest 32 MB cards.

The suggested retail price for the camera is $1,369, but Fuji estimates the street price will be around $1,200. We'll have a more detailed review of this camera in a future issue.—*DT*

Fuji Photo Film http://home.fujifilm.com

Cantrek limits searches to Canada

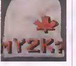
Annoyed with all the U.S. sites returned by so-called Canadian-site search engines, Edmonton-based Cantrek developed a searchable directory that returns only Canadian sites.

Company representatives inspect every site that's submitted to make sure it is truly Canadian in every respect. Sites that charge in U.S. funds, for example, are rejected. This presumably makes it easier for Canadian online shoppers to establish the cost of goods or services they find in the directory without having to dance through fluctuating looney exchange calculations.

Cantrek charges companies $4.99 annually to list a Web site in the directory.—*DT*

Cantrek http://www.cantrek.com

A gift only Canucks understand



From Mytookeh Inc. in Guelph, Ont., comes the perfect Y2K gift—a toque with MY2K? (my toque, eh?) and a maple leaf knitted into the design. The company says it will take individual orders, or corporate orders with logo or name added.

The basic toque sells for $14.50 plus sales taxes and a shipping fee. Order forms and more details are available at the company's Web site.—*DT*

Mytookeh, http://www.mytookeh.com

Continued on page **14**

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Canon jets along at 10 ppm

Canon Canada Inc. says its latest BJC-5100 bubble jet printer is 33 percent faster than the 5000 model it supersedes.

The printer achieves this speed when two black ink cartridges are installed. Canon says a side-by-side printhead design means the two cartridges work in tandem, each printing one half of the page, which results in faster printing. The BJC-5100 is rated at 4 pages per minute (ppm) for color output.

The printer, which has an estimated price of $300, will print at up to 1,440x720 dot-per-inch resolution. A seven-color photo ink cartridge is available for photorealistic printing.

Canon also expanded its CanoScan line of consumer-oriented flatbed scanners by adding a USB model. The CanoScan FB 620U has an estimated price of $200 and offers 600x600 resolution scanning. —*DT*

Canon Canada Tel: 800-263-1121
http://www.canon.ca

3Com Canada unveils wireless plans

3Com Canada plans to offer wireless connectivity solutions for simple and reliable access to information when and where their customers need it. The plan includes wireless connections aimed at enterprise customers, travelers and home users.

Enterprise customers can expect 3Com to deliver high-speed wireless connections to mobile workers who need to access email, corporate information, or the Internet from anywhere in an office environment. For travelers, 3Com plans to create reliable connections to corporate information and the Internet using the wireless Palm VII handheld computer (which will be released in the fall by 3Com's Palm Computing division). Home users will benefit from soon-to-be-released products designed to wirelessly connect multiple PCs in the home, allowing sharing of high-speed Internet access, documents, printers, and multiplayer games.

These solutions are scheduled to be released over the next 12 months, beginning with 3Com's plan to provide wireless connectivity to various carriers by the summer. The fall will see the release of new Palm handheld device, which will include the Palm.Net communication services, as well as 3Com's AirConnect wireless LAN for enterprises. By the end of the year, 3Com will roll out its high-speed wireless LAN products for home and small offices.

"3Com's vision is that networking will be pervasive. As new network connections proliferate, and connections number in the billions, people will demand simple, immediate and reliable access to information," said 3Com Canada president, Dan Servos.

Pat Kewin, director of 3Com Canada's small and medium enterprise business unit, added that 3Com's forthcoming wireless solutions "will change the way people think about worker productivity and data access." —*KS-R*

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Letters

Continued from page 9

file, the types of file formats we support, the physical media (e.g., Zip, Jazz or Syquest) we can read, as well as the file formats we don't accept. Many printers supply similar information to their customers.

An electronic notebook?

I was on a flight recently and one of the magazines advertised a product that was a notebook (paper) that electronically recorded what was written on it. Have you ever seen a product like this?

Robert Amello

TCP *replies. Your description is a bit sketchy, but it could be a CrossPad, which was co-developed by IBM and Cross Pen Computing Group.*

Note paper sits on the pad's surface, which is actually a digitizer. As you write on the paper with a special CrossWriter digital pen, a radio frequency signal sent out by the pen is picked up by the digitizer beneath, and your words, sketches, etc. are also recorded and stored in a format called IBM Ink. The CrossPad will store approximately 50 handwritten letter-size pages, while the smaller CrossPad XP will hold 80 memo-size (6x9-inch) pages.

Using a serial connector, you can download the Ink files to a computer, where an application called the IBM Ink Manager allows you index the pages, or manipulate the handwriting bitmaps. You can, for example, convert handwritten words to ASCII text, or cut and paste a hand-drawn sketch into another application. ❑

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433MHz w/128KB L2 .... $ 880
466MHz w/128KB L2 .... $ 935

Power Station:All-in-One

Xcel2000 Slot 1 Micro ATX Main Board
32MB 168 Pin SDRAM (PC 100)/1.44MB FDD
6.4GB Ultra DMA-66 IDE Hard Drive
Ultra DMA-66 Cont. w/2x16550 Serial
1xBi-Directional Parallel, 2xUSB Port
On Board 64 Bit 3D Graphics Accelerator
On Board 3G Sound Pro Wavetable Card
On Board 56KBps Modem & 10/100Mbps LAN
44x Speed UDMA CD-ROM,Speakers
15" Non-Int Low Rad. SVGA Monitor PnP
ATX Mid Tower Case with CSA Power Supply
107-keys Windows 98 Keyboard,PS/2 Mouse
2 Year Parts & Service Warranty

CELERON

366MHz w/128KB L2 .... $ 820
400MHz w/128KB L2 .... $ 875
433MHz w/128KB L2 .... $ 910
466MHz w/128KB L2 .... $ 965

Superior Station 3D NOW!

AMD K6-2 3D Processor w/64KB L1 cache
Acer MX59Pro MVP4 ATX Main Board w/512KB Cache
32MB 168 Pin High Performance SDRAM (PC100MHz)
1.44MB Floppy Drive
4.3GB Ultra DMA-66 IDE Hard Drive
Ultra DMA-66 IDE Controller
2 x 16550 Serial, 1 Parallel & 2xUSB Port
On Board Trident Blade 3D Graphics Engine
On Board AC-97 2.0 Audio Sound Card
44x Speed UDMA CD-ROM,Speakers
15" Non-Int SVGA Monitor .28mm dp PnP
ATX Mid-Tower Case with CSA Power Supply
107 keys Win98 Keyboard, PS/2 Mouse
2 Year Parts & Service Warranty

AMD K6-2 3D

K6-2 30 350 $ 760
K6-2 30 400 $ 790
K6-2 30 450 $ 850
K6-2 30 475 $ 915

Video Graphics Adapters

ATI 3D Charger AGP 4MB/8MB	$39/64
ATI All-In-Wonder Pro AGP Card 8MB	$1[illegible].00
ATI Xpert98/Xpert99 AGP Card 8MB	$65/88
ATI Rage 128 AGP Card 16MB	$139.00
ATI Rage Fury/Magnum AGP 32MB	$230/320
ATI TV Wonder Tuner Card (NTSC)	$122.00
ASUS AGP-V3400 nVIDIA TNT TV Out,Video-in 16MB	$265.00
Creative Labs Graphics Blaster Banshee AGP 16MB	$1[illegible]
Creative Labs Graphics Blaster TNT AGP 16MB	$130.00
Creative Labs 3D Blaster Savage 4 AGP 16MB	$166.00
Creative Labs 3D Blaster TNT2 Ultra 32 TV Out	$320.00
Matrox Millennium/Mystique G200 AGP 8MB SGRAM	$145/170
Matrox Marvel G200-TV (16-in-1)	$[illegible]
Matrox Millennium G400 AGP 16/32MB SGRAM	$177/288
Matrox Millennium G400 AGP 16/32MB Dual Display	$205/270
S3 Savage 128Bit 3D AGP 8MB	$66.00

Monitors

ADI E44/NP 15" NI,LR(1280x1024 .28mmDP)	$238/257
ADI SF-4/6GT 17" NI,LR(1280x1024 .26/.25mmDP)	$440/500
ADI 6G 21" NI LR(1280x1200, .28mmDP)	$1235.00
Mag XJ500T/700T 15"/17" NI (1280x1024 .25mmDP)	$260/400
NEC A500+/A700+ 15"/17" .28mmDP DotTrio	$265/400
NEC E500/E750 15"/17" .25mmDP Cromaclear	$565/650
NEC E950 19" Cromaclear (1280x1200 .25mmDP)	$832.00
Panasonic E70 17" (1280x1024 .27mmDP)	$3[illegible].00
Panasonic S50/SL70 15"/17" (1280x1024 .27mmDP)	$[illegible]
Panasonic SL90 19" PS(1280x1200 .25mmDP)	$[illegible].00
Panasonic S110 21" (1600x1200 .25mmDP)	$1325.00
Proview 15" NI LR(1280x1024 .28mmDP)	$188.00
Proview 17" NI,LR(1280x1024 .26mmDP)	$315.00
Proview 17" NI,LR(1280x1024 .26mmDP)	$335.00
Sony 110GS 15" NI,LR(1280x1024 .25mmDP)	$328.00
Sony 210GS 17" NI,LR(1280x1024 .25mmDP)	$550.00
Sony 200GS 17" NI,LR(1280x1024 .25mmDP)	$715.00
Sony 400PS 19" NI,LR(1600x1200 .25mmDP)	$[illegible]
Sony 520GS 21" NI,LR(1600x1200 .25mmDP)	$1590.00
Samsung 550b 15" NI,LR(1280x1024 .28mmDP)	$276.00
Samsung 700b 17" NI,LR(1280x1024 .28mmDP)	$40[illegible]

HD/FD Controllers

ISA DE HD/FD Controller with I/O UART 16550	$22.00
Adaptec 1505/2906 SCSI CD-ROM Controller	$65/80
Adaptec 2910/2920 PCI SCSI Controller	$135/160
Adaptec 2940U/2940UW PCI SCSI Controller	$[illegible]/210
Adaptec 2940U2W PCI Ultra 2 SCSI Controller	$[illegible]
Adaptec AAA-131CA RAID SCSI Kit	$[illegible]
Promise UltraM PCI Controller	$[illegible]

Keyboards & Cases

[illegible]	$[illegible]
Qtronix Windows 98 Keyboard	$12.50
Logitech Deluxe Keyboard	$23.00
Logitech Internet Keyboard	$37.00
Logitech Cordless Desktop-Keyboard & Mice	$120.00
Microsoft Natural Keyboard Elite OEM	$58.00
17/18" ATX Mid Size Tower w/ CSA Power Supply	$48/56
20" ATX Tower with 250W CSA Power Supply	$[illegible]
Full Size Tower 48X 300W CSA Power Supply	$90.00
18/19" Mid Size Tower with CSA Power Supply	$[illegible]

Drives & Tape Backup

1.2MB 5.25"/1.44MB 3.5" Floppy Drive	$[illegible]/23
Panasonic LS-120 120MB Floppy Drive(2x Speed)	$115.00
Ultra DMA 13GB/17.2GB/[illegible] HDD	$270/340/570
[illegible] 10GB/13GB 7200 RPM HDD	$250/280/430
Iomega 2GB Int/Ext JAZ Drive	$485.00
HP Colorado 5GB Int/Ext Backup Drive (no media)	$245/320
HP Colorado 8GB Int/Ext Backup Drive (no media)	$320/380
HP Colorado 14GB Int/Ext Backup Drive (no media)	$390/400
Seagate 8GB TR-4 Int IDE/SCSI Tape Backup Drive	$346/40[illegible]

Motherboards

Intel N440BX Pentium II Server Board	$75[illegible]
Intel L440GX Pentium II Server Board	$[illegible]
Abit BH6 440BX Pentium II/III Board (AGP)	$148.00
Abit BX6 440BX Pentium II/III Board (Ver 2.0)	$170.00
Acer MX59Pro MVP4 Socket 7 Board w/Sound & Video	$188.00
ASUS P5A-B-A 100MHz AGP Socket 7 512KB L2	$130.00
ASUS P2BF 440BX Pentium II/III Board (AGP)	$166.00
ASUS P2BS 440BX,Ultra2SCSI Board	$470.00
ASUS P2BDS 440BX,Dual CPU Ultra2SCSI Board	$[illegible]
PC Partner VIA MP3 100MHz AGP Socket 7 512KB L2	$[illegible]

MultiMedia

Aztec AW[illegible] Wavetable Sound Card (ASD)	$33.00
Creative Labs Sound Blaster 16 PnP	$51.00
Creative Labs Sound Blaster AWE64/ PCI 128	$46/80
Creative Labs Sound Blaster Live/Live Value	$270/78
Crystal ISA Sound Card	$18.50
44X/48X IDE CD-ROM Color	$61/73
Hewlett Packard 8100/8200i Int IDE CDRW	$403/480
Pioneer/Toshiba 48X SCSI CD-ROM Drive	$118/156
Panasonic 7502B Int 4x8 SCSI CD-R Drive	$[illegible]
Panasonic 6x/Pioneer 6x DVD ROM Drive	$129/188
Sony CRX100E/140E Int 4x4x24 IDE CDRW Drive	$380.00
Yamaha CRW4416 Int/Ext 4x4x16 SCSI CDRW	$387/501

Modem & Mice

56Kbps V.90 PCI Int. Modem w/Voice	$2[illegible]
Diamond SupraMax 56K v.90 PCI Voice	$[illegible]
Diamond SupraExpress 56K v.90 Int Voice	$110.[illegible]
US Robotics Sportster ISDN 128K Int.	$27[illegible]
US Robotics 56K v.90 Int/Ext Fax Modem	$1[illegible]
US Robotics 56K v.90 USB Pro Ext Modem	$27[illegible]
Zoltrix 56K v.90 External Fax Modem	$[illegible]
Diamond CyberMouse Pen	$[illegible]
Genius NetMouse with Magic-Button	$1[illegible]
Logitech Mouseman/FirstMouse+ OEM	$1[illegible]
Logitech Trackman Marble FX	$102.[illegible]
Microsoft J Mouse/IntelliMouse	$[illegible]
Microsoft Composite Mouse	$[illegible]

Printers

Canon BJC-[illegible] Color Inkjet	$175.00
Canon BJC-4400/ljx/5000 Color Inkjet	$1[illegible]/3[illegible]
Canon BJC-6000/7000L Color Inkjet	$[illegible]/467
Brother HL1020 Laser Printer 600dpi 10ppm	$3[illegible]
Epson Stylus 440 Color Inkjet 720dpi	$20[illegible]
Epson Stylus 640/740 Color Inkjet 1440dpi	$290/363
Epson Stylus Photo750 Color Inkjet 1440dpi	$4[illegible]
Epson Stylus PhotoEX,11"x44"	$[illegible]
Epson Stylus 850/850N Color Inkjet 1440dpi	$620/751
Epson Stylus 900 Color Inkjet 1440dpi	$870.00
HP 895C/722C Deskjet Color Printer	$357/[illegible]
HP 890C/895Cxi Deskjet Color Printer	$40[illegible]
HP 1120C/2000C Deskjet Color Printer	$[illegible]/810
HP 2500C Professional Series Color Printer	$1420.00
HP 4050 Laserjet,1200 dpi 17ppm	$1760.00
HP 1100/1100A Laserjet 600 dpi 8 ppm	$820/740
HP 2100/2100M Laserjet,1200 dpi 10 ppm	$1080/1230

COMPAQ
Authorized Reseller

HEWLETT PACKARD
Authorized Retailer

Business Partner

3Com Networking Partners
Networking Partner

digital

Intel Processor Dealer

MicroConcept
102 - 1245 West Broadway
Vancouver, B.C. V6H 1G7

Pentium III - Game Blaster

Intel Pentium II/III Processor with MMX Technology
Asus P2B-F/Abit BH6 440BX AGP/PCI/ISA ATX Main Board
64MB 168 Pin High Performance SDRAM (PC100MHz)
1.44MB Floppy Drive
10.2GB Ultra DMA 66 IDE Hard Drive
Ultra DMA33 Cont. w/2x16550 Serial,1xBi-Directional Parallel
AGP 3dfx Voodoo 3000 Graphics Card with 16MB
Creative Labs Sound Blaster Live! Value Card Environmental Audio
3rd Generation DVD-ROM Drive/GNT-5000A Sub-woofer Speaker
Optiquest Q71 17" .27mm Dot Pitch Non-Int SVGA Monitor
ATX Mid Tower Case with CSA Power Supply
107-keys Windows 98 Keyboard,PS/2 Mouse
2 Year Parts & Service Warranty

PII 400MHz 512KB L2 ..... $1,690
PIII 450MHz 512KB L2 .... $1,830
PIII 500MHz 512KB L2 .... $2,155
PIII 550MHz 512KB L2 .... $2,635

Monthly Spacial !! Big Saving!!!

SIMM Memory

16MB 60ns 72-Pin EDO SIMM	$40.00
32MB 60ns 72-Pin EDO SIMM	$79.00
32MB SDRAM PC-100 compliant	$38.00
64MB SDRAM PC-100 compliant	$76.00
128MB SDRAM PC-100 compliant	$145.00
256MB SDRAM PC-100 compliant	$366.00
64MB ECC SDRAM PC-100	$95.00
128MB ECC SDRAM PC-100	$170.00
256MB ECC SDRAM PC-100	$435.00
4MB 70ns 30-Pin SIMM	$10.00

LIFETIME WARRANTY
PROVEN PERFORMANCE

Iomega Zip

100MB Zip Cartridge

organize, move & Backup your Stuff **$13.25**

BASF/Verbatim

74Min/650MB CD-R

BASF CDR - $1.62
Verbatim CDR - $2.05
BASF CDRW - $5.95

D-Link DFE-905

4 Port 10/100 Hub, 2x UTP 20 ft. Cable & 2x DFE-530TX
$165.00

Impression

56KBps V.90 Internal Voice Fax Modem
$28.50

MICROCONCEPT NETWORK PRODUCTS FOR LESS !!

NOVELL Software

NetWare v3.2

NetWare v3.2 5/10 User	$1366/$195
NetWare v3.2 25/50 User	$4675/8315
NetWare v3.2 100/250 User	$8840/15765
NetWare v3.2 Enhancement Pack	$615

IntraNetWare v5

NetWare 5 Server Plus 5 User Lic.	$1505
NetWare 5 5/10 Additive Lic. Only	$1060/1795
NetWare 5 25/50 Additive Lic. Only	$8458/8188
NetWare 5 100/250 Additive Lic. Only	$8840/17000
NetWare 5 500 Additive Lic. Only	$34125

MICROSOFT NT

Windows NT Server
Windows NT Workstation

Windows NT Server v4.0 CD w/5 Clients Lic.	$1085
Windows NT Server v4.0 CD w/10 Clients Lic.	$1600
Windows NT v4.0 Client Access Lic.	$46
Windows NT Server v4.0 upgrade w/5 Clients Lic.	$456
Windows NT Server v4.0 upgrade w/10 Clients Lic.	$655
Windows NT Workstation 4.0 CD	$420
Windows NT Workstation 4.0 upgrade	$256
BackOffice Small Business Server v4.0 w/5 Clients	$2085
BackOffice Server v4.5 w/5 Clients	$4300
Microsoft SMS version 2.0 w/10 Clients Lic.	$1586
Microsoft SMS version 2.0 w/25 Clients Lic.	$2456
Microsoft SNA Server v4.0 w/5 Clients Lic.	$1845

Network Printers

HP LaserJet 5 200
1200dpi 4MB
$1425.00

HP 4050N Laserjet,1200dpi,17ppm,16MB,Network	$2280
HP 4050TN Laserjet,1200 dpi,17ppm,16MB,Network	$2460
HP 5000 Laserjet,1200dpi,16ppm 11x17"	$2265
HP 5000N Laserjet,1200dpi,16ppm,11x17",Network	$2850
HP 5000GN Laserjet,1200dpi Graphics Intensive	$4075
HP 8100 Laserjet,1200dpi,32ppm	$4236
HP 8100N Laserjet,1200dpi,32ppm,Network	$4700
HP 8100DN Laserjet,1200dpi,32ppm,Duplexer	$5400
HP 4500 Color Laserjet,600dpi/ReT/600,32MB	$2870
HP 4500N Color Laserjet,600dpi,64MB,Network	$4398
HP 8500 Color Laserjet,600dpi,12x18" 32MB	$5400
HP 8500N Color Laserjet 600dpi 32MB Network	$10080
Lexmark Optra E310 8ppm,2MB	$626
Lexmark Optra K1220 12ppm,2MB	$1020
Lexmark Optra S 1255 12ppm,4MB	$1425
Lexmark Optra S 1255N,12ppm 4MB,10/100BaseTx	$1845
Lexmark Optra S 1625 16ppm,4MB	$1810
Lexmark Optra S1625N 16ppm,4MB,10/100BaseTx	$1945
Lexmark Optra S 1855 18ppm,4MB	$1870
Lexmark Optra S 1855N,18ppm,4MB 10/100BaseTx	$2190
Lexmark Optra S 2455,24ppm,8MB	$2765
Lexmark Optra S2455N,24ppm 14MB, 10/100BaseTx	$3260
Lexmark Optra Se3455,24ppm,8MB	$3418
Lexmark Optra Se3455N,24ppm,16MB,Network	$3910
Lexmark Optra SC 1275,3ppm,16MB	$3426
Lexmark Optra SC 1275N 3ppm,32MB	$4845
Lexmark Optra Color 1200 12ppm 1200dpi,11x17"	$7850
Lexmark Optra Color 1200N 12ppm 1200dpi 11x17"	$8856

Tape / CD ROM Drive

Exabyte 8900SW 20-40GB Int/Ext 8mm Drive	$3765/4155
Exabyte Eliant 820 14GB Int/Ext Tape Drive	$1815/2200
Iomega Ditto Max 7GB Int/Ext Tape Drive	$200
Hewlett Packard Surestore 8GB Int/Ext DAT Drive	$1150/1300
Hewlett Packard SureStore 24GB Int/Ext DAT Drive	$1636/1886
Hewlett Packard SureStore DLT 40/e Drive	$8725/4065
Hewlett Packard SureStore T20 20GB Int/Ext Drive	$626/760
Onstream 30GB IDE/SCSI Int. Drive Echo SW Incl.	$420/720
Onstream 30GB SCSI Int. Drive Echo SW Incl.	$1000
Seagate Scorpion 8GB DAT Int/Ext Drive	$900/1100
Seagate Scorpion 24GB DAT Int/Ext Drive	$1330/1525
Seagate Scorpion 100GB DAT Int/Ext Drive	$3470/3600
Seagate Sidewinder AIT 70GB Int/Ext SCSI Drive	$8225/4020
Seagate Sidewinder AIT 200GB Int/Ext SCSI Drive	$8880/7150
Seagate TapeStore 20GB Int IDE/SCSI Tape Drive	$600/825
Sony SDT-7000 Int/Ext. 4-8GB DAT	$1055/1200
Sony SDT-9000 Int/Ext. 24GB DAT	$1425/1640
Sony AIT 200GB Int/Ext Autoloader	$6545/7335

Power Protection

APC BackUPS 300
$139.00

American Power 120 Volt

BackUPS 200/300	$120/130
BackUPS 500M/650M	$162/200
BackUPS Pro 280/350/420	$563/266/336
BackUPS Pro 500/650	$340/405
BackUPS Pro 1000/1400	$640/690
SmartUPS SU420/SU620	$350/440
SmartUPS SU700/SU1000/SU1400	$516/728/940
SmartUPS SU2200/SU3000	$1330/2480
6000 UPS Office BF280	$120
Matrix 3000VA/5000VA (Modular UPS)	$8873/8066
SmartCELL for Matrix 3000/5000	$610
Line Conditioner LR600/LR1250	$130/175
Personal SurgeArrest 7/7 Outlets with Tel	$20/30
Professional SurgeArrest 7/7 Outlets with Tel	$34/58
Professional SurgeArrest 8/8 Outlets with Tel	$40/62
Network SurgeArrest 7/7 Outlets with Tel	$82/88
Notebook Surge Protector	$22

Cables & Jacks

Twisted Pair

Assembly, 10 BaseT Cable 10/25/50 ft	$6/15/23
Assembly, 10 BaseT Cable 100 ft	$30
Cable, 10BaseT 8c UTP per ft	$0.30
Cable, 10BaseT 8c UTP per 1000 ft	$200
Connector RJ45M	$0.30
Tool,RJ45 Crimping	$20
Multi-Network Cable Tester	$66

Coaxial

Assembly RG58A/U Thin Coax 25/50 ft	$15/22
Assembly RG58A/U Thin Coax 100 ft	$30
Cable, RG58A/U Bulk per ft	$0.25
Cable RG58A/U Bulk per 1000 ft	$160
Connector BNC "T"	$2.00
Terminator BNC, 50 ohm	$2.00
Tool,BNC Crimping	$30
Terminator BNC 50 ohm w/ground strap	$3.00

Ethernet Coax / Combo Adapters

3COM 3C509B ISA Ethernet III Combo	$156
3COM 3C900B PCI Ethernet XL Combo	$178
D-Link DE-220PCT ISA Ethernet Combo	$30
D-Link DE-530CT+ PCI Ethernet Combo	$26
Intel PCLA8210B ISA EtherExpress Pro 10+ Combo	$90
Intel PCLA8210B ISA EtherExpress Pro 10+/Flash Combo	$115
Intel PILA8500 PCI EtherExpress Pro 10+ Combo	$178
SMC 1208BT PCI EzCard Combo	$30
SMC 8416BT ISA EtherEZ Combo	$61
SMC 8432BT PCI EtherPower Combo	$81

Print Servers

HP JetDirect J2258A 170X 10BaseT Ext Print Server	$222
HP JetDirect J4100A 400N 10/100BaseT Print Server	$800
HP JetDirect J2591A 300X 10/100BaseT Ext Print Server	$380
HP JetDirect J3265A 500X 10/100BaseT Ext Print Server	$610
HP JetDirect J3110A 600N RJ45	$670
HP JetDirect J4153A Auto Switches (Two to One)	$60
HP JetDirect J4154A Auto Switches (Four to One)	$140
Intel NetportExpress Pro Ext. Printer Server PCLA2151	$370
Intel NetportExpress 10/100 Ext. Printer Server 1 Port	$316
Intel NetportExpress 10/100 Ext. Printer Server 3 Port	$488
Netgear PS104 4 Port 10BaseT Print Server	$150
Netgear PS110 10/100BT Print Server	$245

PCMCIA Adapters

D-Link DE-660CT PCMCIA Combo NE2000 Compatible	$110
D-Link DME 560TX Ethernet/56K Fax Modem	$335
Xircom Realport 10/100 Ethernet + 56K v.90 Modem	$445
Xircom Realport 10/100 Fast Ethernet CardBus	$214
Xircom Realport RM56 56K v.90 Modem	$100
Xircom PCMCIA CM-56 56Kbps Modem	$165
Xircom PCMCIA 10/100 Ethernet + 56K Modem	$370
Xircom CardBus CBE2 10/100 Ethernet Card	$215

10 BaseT Hubs

3COM 3C16440 SuperStack II Entry Hub 12 Port	$220
3COM 3C16441 SuperStack II Entry Hub 24 Port	$390
3COM 3C16690 SuperStack II PSH Hub 40 16 Port	$710
3COM 3C16695 SuperStack II PSH Hub 40 24 Port	$1060
3COM 3C16650 SuperStack II PSH Hub 80 24 Port	$1555
3COM 3C16670A SuperStack II Hub 10 12 Port	$760
3COM 3C16671A SuperStack II Hub 10 24 Port	$1010
3COM 3C16610 SuperStack II Dual Speed Hub 16 Port	$1000
3COM 3C16611 SuperStack II Dual Speed Hub 24 Port	$1355
3COM 3C16700 OfficeConnect 4/TPC	$110
3COM 3C16701 OfficeConnect 8/TPC	$149
3COM 3C16702 OfficeConnect 16/TPC	$265
3COM 3C16704 OfficeConnect 4/TPO	$72
3COM 3C16710 OfficeConnect 8/TPM	$465
D-Link DE-805 TPC 5 Port Hub	$70
D-Link DE-809TC 8 Port Hub	$90
D-Link DE-812TP+ 12 Port Hub	$200
D-Link DE-816TP 16 Port Hub	$230
D-Link DE-824TP 24 Port Hub	$341
D-Link DE 1824 24 Port SNMP Stackable Hub	$600
Intel InBusiness SH10T5 5 Port Hub	$70
Intel InBusiness SH10T 8 Port Hub	$90
Intel InBusiness SH10T8B 8 Port Hub (with coax)	$116
Intel InBusiness SR10TPS Internal Station	$565
Netgear EN104TP/NA/EN104NA 4 Port Hub	$54/73
Netgear EN108TP 8 Port Hub	$95
Netgear EN108TP/NA/EN108NA 8 Port Hub	$73/116
Netgear EN116NA 16 Port Hub	$166
SMC 3606T-EZ 6 Port Hub	$60
SMC 3608T-EZ 8 Port Hub	$63
SMC 3616TC EZ 16 Port Hub (with coax)	$260

10 BaseT Adapters

3COM 3C509B ISA Ethernet III TPO	$70
3COM 3C900B PCI Ethernet XL TPO	$76
3COM 3C18000 10BaseT USB Network Interface	$92
Intel PCLA8210B ISA EtherExpress Pro 10+ 10BaseT	$84
Intel PILA8500 PCI EtherExpress Pro 10+ 10BaseT	$123
SMC 1660T ISA 10BaseT	$53
SMC 1208T PCI EzCard 10BaseT	$53
SMC 8416T ISA EtherEZ 10BaseT	$57
SMC 8432T PCI EtherPower 10BaseT	[illegible]

Switches

3COM 3C16733 OfficeConnect Switch 4 10/100BaseT	$415
3COM 3C16951 SuperStack II 10 Switch 1100 12 Port	$1046
3COM 3C16950 SuperStack II 10 Switch 1100 24 Port	$1450
3COM 3C16981 SuperStack II 100 Switch 3300 12 Port	$2256
3COM 3C16980 SuperStack II 100 Switch 3300 24 Port	$5425
3COM 3C39024 SuperStack II 100 Switch 3900 24 Port	$7250
D-Link DES1008M 10/100 8 Port Modulized Switch	$636
Intel InBusiness BS10 1TX8 8 Port Switch	$430
Intel Express 410T 10/100 Standalone Switch 16 Port	$1285
Intel Express 410T 10/100 Standalone Switch 24 Port	$1455
Intel Express ES1000RPUG Gigabit Switch 7 Port	$12500
Netgear FS108 2 10/100BaseT Port Switch	$156
Netgear FS104 4 10/100BaseT Port Switch	$314
Netgear SW108 Ethernet Switch 8 10BaseT	$290
Netgear SW516NA Ethernet Switch 4 10BT/2 100B-TX	$475

100/1000 Mbps Systems

3COM 3C905B TX PCI
Fast Ethernet Adapter
$78.00

3COM 3C905B-TX FastEtherLink PCI	$78
3COM 3C905B-COMBO Fast EtherLink 10/100 Combo	$205
3COM 3C980B-TX Fast EtherLink Server Card	$180
3COM 3C985B-SX Gigabit EtherLink Server Card	$1090
3COM 3C16722 OfficeConnect FastEthernet 8 Port Hub	$265
3COM 3C16721 OfficeConnect FastEthernet 12 Port Hub	$486
3COM 3C16750 OfficeConnect 10/100 8 Port Hub	$326
3COM 3C16751 OfficeConnect 10/100 16 Port Hub	$475
3COM 3C250C-TX/12 SuperStack II 100 12 Port Hub	$1146
3COM 3C250C-TX/24 SuperStack II 100 24 Port Hub	$1590
D-Link DFE-530TX PCI FastEthernet	$53
D-Link DFE-2616sr Dual Speed 16 Port Managed Hub	$1145
D-Link DFE-816 FastEthernet 16 Port Stackable Hub	$950
D-Link DSH-8 Dual Speed 10/100 8 Port Hub	$150
D-Link DSH-8 Dual Speed 10/100 8 Port Hub	$270
D-Link DSH-16 Dual Speed 10/100 16 Port Hub	$610
Intel PILA8460 Pro 100+ PCI Fast Ethernet Adapter	$75
Intel PILA8470 EtherExpress Pro/100+ Server Adapter	$140
Intel PILA8472 Pro 100+ Dual Port Server Adapter	$365
Intel PILA8480 Pro 100 PCI Intelligent Server Adapter	$455
Intel PWLA8490 Pro/1000 Gigabit Server Adapter	$950
Intel InBusiness SH100TX4 FastEthernet 4 Port Hub	$150
Intel InBusiness SH100TX8 FastEthernet 8 Port Hub	$280
Intel InBusiness SH101TX8 FastEthernet 8 10/100 Hub	$325
Intel Express 330T Stackable Hub 10/100 16 Port	$1225
Intel Express 330T Stackable Hub 10/100 24 Port	$1074
Netgear FA310TP 100 PCI FastEthernet	$36
Netgear GA620 Gigabit Ethernet Card	$460
Netgear FE104NA 100 4 Port Hub	$100
Netgear FE108NA 100 8 Port Hub	$200
Netgear DS104NA 10/100 Dual Speed 4 Port Hub	$133
Netgear DS108NA 10/100 Dual Speed 8 Port Hub	$245
Netgear DS516NA Dual Speed 16 Port Stackable Hub	$630
Netgear DS524NA Dual Speed 24 Port Stackable Hub	$780
SMC 1211TX EzCard 10/100Base-T PCI	$38
SMC 5208TX EZHub 100 8 Port Hub	$243

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AMD K6-2 3D 475 MHz $365

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ML320/321	435	9	$505/705
ML520/521	435	9	$605/805
ML390/391	390	24	$625/705
ML395/Color	607	24	$1585/1695
ML590/591	360	24	$705/915

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3000 AGP $255
3500 AGP $365

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Capacity	Model	Access	Cache	RPM	Interface	Price
4.55GB	ST34520W	10ms	512KB	7200	ULTRA WIDE	$ 300
4.5GB	ST34573W	7.5ms	512KB	7200	ULTRA WIDE	$ 505
4.5GB	ST34573LW	7.5ms	1MB	7200	ULTRA 2 SCSI	$ 519
4.5GB	ST34502LW	6ms	1MB	10000	ULTRA 2 SCSI	$ 680
9.1GB	ST39140W	10ms	512KB	7200	ULTRA WIDE	$ 495
9.1GB	ST39173W	8ms	512KB	7200	ULTRA WIDE	$ 616
9.1GB	ST39173LW	8ms	512KB	7200	ULTRA 2 SCSI	$ 625
9.1GB	ST39175LW	5.8ms	1MB	7200	ULTRA 2 SCSI	$ 635
9.1GB	ST39102LW	6ms	1MB	10000	ULTRA 2 SCSI	$ 860
18.2GB	ST118273W	8ms	512KB	7200	ULTRA WIDE	$1116
18.2GB	ST118273LW	8ms	1MB	7200	ULTRA 2 SCSI	$1130
18.2GB	ST318275LW	6.8ms	1MB	7200	ULTRA 2 SCSI	$1230
18.2GB	ST318203LW	8ms	1MB	10000	ULTRA 2 SCSI	$1375
36.4GB	ST136475LW	8ms	1MB	7200	ULTRA 2 SCSI	$2220
9.1GB	39130U2	7.5ms	512KB	7200	ULTRA 2 SCSI	$ 490
9.1GB	309170U2	7ms	2MB	7200	ULTRA 2 SCSI	$ 625
9.1GB	9LZXU24M	5.3ms	4MB	10020	ULTRA 2 SCSI	$ 880
18.2GB	318350U2	7ms	2MB	7200	ULTRA 2 SCSI	$1070
18.2GB	18ZXU2	5.3ms	4MB	10000	ULTRA 2 SCSI	$1350
30GB	XP30U2	7.5ms	4MB	7200	ULTRA 2 SCSI	$2045
30GB	33800ZX-LW	5.4ms	2MB	10000	ULTRA 2 SCSI	$2885
4.55GB	WD4550-0024	8ms	512KB	7200	ULTRA 2 SCSI	$ 500
9.1GB	WD9100-0024	8ms	512KB	7200	ULTRA 2 SCSI	$ 609
9.1GB	WD9100-AV30	8ms	4MB	7200	ULTRA 2 SCSI	$ 625
18GB	WD18300-048	8ms	512KB	7200	ULTRA 2 SCSI	$1080
4.5GB	QM304550PX	7.5ms	512KB	7200	ULTRA 2 SCSI	$ 388
9.1GB	QM309100PX	7.5ms	512KB	7200	ULTRA 2 SCSI	$ 565
9.1GB	QM309100TD	8ms	1MB	7200	ULTRA 2 SCSI	$ 680
9.1GB	QM309100TN	5ms	2MB	10000	ULTRA 2 SCSI	$ 825
18.2GB	QM318200TD	8ms	1MB	7200	ULTRA 2 SCSI	$1095
18.2GB	QM318200TN	5ms	2MB	10000	ULTRA 2 SCSI	$1380
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ACS48 PowerCube Plus Speaker (3 pcs) $179.00
ADA70 Digital PowerCube Speaker (3 pcs with USB) $185.00
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YST-M20 10 Watts/ch Multimedia Speaker w/DSP $66.00
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PC Works Desktop Speaker $56.00
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721TX	PII333	64MB	6GB	24X	14.1 TFT	$3,535
722TX	PII366	64MB	10GB	24X	14.1 TFT	$4,265
512T	Cel366	32MB	4GB	24X	12.1 TFT	$2,555
330T	PII300	32MB	4.8GB	24X	12.1 TFT	$2,810
332T	PII366	64MB	6.4GB	24X	12.1 TFT	$3,785
313T	266MMX	32MB	3GB	24X	8.4 TFT	$2,535

ThinkPad

IBM

ThinkPad 390E

Intel Celeron 300MHz MMX
32MB Memory
3.2GB Hard Drive
24X CD ROM
56Kbps Fax Modem
12.1" TFT Display

LAPTOP BEST BUY

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360Z	PII300	32MB	4.0GB	24X	13.3 TFT	$3,620
390E	Cel300	32MB	3.2GB	24X	12.1 TFT	$2,630
390E	PII300	32MB	3.2GB	24X	13.3 TFT	$3,230
390E	PII300	64MB	4.3GB	24X	14.1 TFT	$3,690
390E	PII333	64MB	6.4GB	24X	14.1 TFT	$4,245
560Z	PII233	32MB	4.0GB		12.1 TFT	$3,340
560Z	PII300	64MB	6.4GB		12.1 TFT	$4,275
570	PII300	64MB	4.0GB		12.1 TFT	$4,095
570	PII333	64MB	4.0GB		13.3 TFT	$4,850
570	PII366	64MB	6.4GB		13.3 TFT	$5,295
600E	PII300	32MB	4.0GB	24X	13.3 TFT	$4,365
600E	PII366	64MB	6.4GB	24X	13.3 TFT	$5,670
600E	PII366	64MB	6.4GB	DVD	13.3 TFT	$5,765
770ED	PII266	64MB	6.1GB	DVD	14.1 TFT	$6,500
770X	PII300	64MB	8.1GB	DVD	14.1 TFT	$6,850
770X	PII300	128MB	8.1GB	DVD	13.7 TFT	$6,135
770Z	PII366	128MB	14.1GB	DVD	14.1 TFT	$7,290
770Z	PII366	128MB	14.1GB	DVD	13.7 TFT	$7,435

FUJITSU

The LifeBook Family
Business Computing

Model	CPU	RAM	HDD	CD	Display	Price
B112	233MMX	32MB	3.2GB		8.4 TFT	$2,315
[illegible]	Cel300	32MB	3.2GB	[illegible]	[illegible]	$2,165
E351	PII300	64MB	4.3GB	24X	13.3 TFT	$3,150
E360	PII333	64MB	6.4GB	24X	13.3 TFT	$3,765
E370	PII366	64MB	6.4GB	24X	13.3 TFT	$4,485
L440	PII266	32MB	4.0GB		[illegible] TFT	$3,325
L440B	PII266	32MB	4.0GB	20X	13.3 TFT	$3,600
L470	PII366	64MB	4.3GB	20X	13.3 TFT	$4,225

COMPAQ

AMD K6

Presario 1670

AMD K6-2 350MHz CPU
64MB RAM exp. to 160MB
4.3GB Hard Drive
128-Bit 3D Graphics 2MB
24X CD ROM
56KBps Fax Modem
13.3" TFT Display

Model	CPU	RAM	HDD	CD	Display	Price
1500c	Cel300	32MB	4.0GB	24X	12.1 TFT	$2,360
1500c	Cel366	32MB	4.0GB	24X	12.1 TFT	$2,865
1700	PII300	32MB	5.0GB	24X	14.1 TFT	$3,650
1750	PII300	64MB	4.0GB	24X	13.3 TFT	$3,325
1750	PII333	64MB	4.0GB	24X	14.1 TFT	$4,190
1750	PII366	64MB	4.0GB	24X	14.1 TFT	$4,385
3500	PII300	64MB	6.4GB		13.3 TFT	$4,075
[illegible]	PII333	32MB	4.1GB		12.1 TFT	$3,540
3500	PII366	64MB	6.4GB		13.3 TFT	$4,500
[illegible]	PII300	64MB	6.4GB	24X	14.1 TFT	$5,585
7600	PII300	64MB	8.0GB	DVD	14.1 TFT	$5,175
[illegible]	PII366	64MB	14.0GB	DVD	14.1 TFT	$6,325

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3Com

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- Razor-Sharp Screen
- Infrared
- Palm OS 3.1
- Stores Up to 6000 Address 5 Years of Appointment 1500 Memos & 1500 To-Do Items

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13.3" TFT Display
24X CD ROM
56KBps V.90 Fax Modem
Built-in Sound System

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266MHz Intel Pentium
32MB RAM exp. to 96MB
4.3GB Hard Drive
2MB EDO Video RAM
10.4" TFT Display
56KBps V.90 Fax Modem
Optional 24X CD ROM
90 Days Warranty
Extend 1 Yr Warranty US$99

Model	CPU	RAM	HDD	CD	Display	Price
[illegible]	[illegible]	64MB	[illegible]		[illegible] TFT	$5,155
3020CT	P300	32MB	6.4GB		10.4 TFT	$3,030
4030CDS	Cel300	64MB	4.3GB	24X	12 DSTN	$2,300
4030CDT	Cel300	64MB	4.3GB	24X	13.3 TFT	$2,990
4060CDT	PII333	64MB	6.4GB	24X	14.1 TFT	$3,765
4090CDT	PII366	64MB	6.4GB	24X	14.1 TFT	$4,110
8000	PII333	64MB	6.0GB	24X	14.1 TFT	[illegible]
8000	PII366	64MB	9.3GB	24X	14.1 TFT	$5,555
8000	PII366	64MB	9.3GB	DVD	14.1 TFT	$5,725
110CT	P233	32MB	4.3GB		7.1 TFT	$2,150

PCMCIA / PC Cards

Item	Price
Adaptec APA-1460B SlimSCSI Kit	$128.00
Adaptec APA-1480A SlimSCSI Kit (Cardbus)	$288.00
Addonics Pocket CD 8X PCMCIA CD-ROM Drive	$308.00
Focus Enhancement TView PressCard(PC to TV)	$308.00
Intel Pro/100 Mobile LAN CardBus II RealPort	$318.00
Intel Pro/100 Mobile LAN CardBus II	$218.00
Intel Pro/100 Mobile LAN 16 bit PC Card	$218.00
Intel Pro/100 LAN+56K Modem CardBus II RP	$408.00
Intel Pro/100 LAN+56K Modem CardBus II	$428.00
Kingston EtherX PCMCIA Ethernet Combo	$118.00
Megahertz 3CXFE575BT 10/100 LAN CardBus	$228.00
Megahertz 3CCFE574BT 10/100 LAN	$188.00
Megahertz 3CXE589ET 10BaseT	$188.00
Megahertz 3CXE589ED 10BaseT/2	$308.00
Megahertz 3CCM156B 56K Global Modem	$308.00
Megahertz 3CXM656 56K Cellular Modem(XJack)	$328.00
Megahertz 3CXM656 56K Win Modem	$228.00
Megahertz 3CCFEM556B 10/100 LAN+56K Modem	$388.00
Megahertz 3CCFEM656B 10/100 LAN+56K ModemCB	$288.00
Megahertz 3CXEM556BT 10BaseT+56K Modem	$228.00
Megahertz 3CXEM556BC 10BaseT/2+56K Modem	$398.00
Micro Solutions 24X Bantam Ultra Light CD-ROM	$228.00
Micro Solutions 24X Bantam CD w/Sound	$288.00
Micro Solutions 32X Backpack CD-ROM	$288.00
Micro Solutions 32X Backpack 4X8 CD w/Sound	$288.00
Netgear FA410 10/100BaseT Ethernet PCMCIA	$128.00
New Media GameJammer PCMCIA PnP	$288.00
New Media BASICS Micro Port	$[illegible]
Nogatech Video Capture Card	$228.00
Nogatech TV Tuner Notebook TV PCMCIA	$385.00

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Item	Price
Targus Notepac CN01/CN30	$41.50
Leather Notebook Case CLN6	$122.00
Platinum Leather Card CPLC1	$228.00
Business Traveler Case CL66	$200.00
Business Keskin Case CKN8	$78.00
Business Commuter Case CBC2	$138.00
Universal Rolling Case CURC1	$188.00
Air Backpack Plus w/APS Black ONP1A	$78.00
Air Deluxe Universal Case OUD1A	$132.00

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TECHNOLOGY CORPORATION

TOSHIBA-Notebook

Model	16MB/32MB/64MB
T100,T100,T110,T115,T400,T405,T410,T415,T420,T420,T430,T435,T510, Tecra750 Series	$104/168/NA
Satellite 220, Satellite Pro 400, Tecra 780	$108/150/280
Satellite Pro 440, 445, 460, 470, 480	$108/266/NA
Portege 300,320,350	$NA/153/409
Portege 7000CT, Satellite 4000,4010,Tecra8000	$NA/166/299
Tecra 400, 510, 520, 480, 650, Portege 650, 660	$NA/206/NA

IBM-ThinkPad

Model	Price
ThinkPad 760E/ED/EL/ELD	$88/128/308
ThinkPad 380/XD/ED E 560,380	$88/129/NA
ThinkPad 760C/CD/L/LD	$88/134/NA
ThinkPad 755, 765 400	$131/229/NA
ThinkPad 380Z	$77/130/233
ThinkPad 770 770E,770ED,TP600 I-Series	$30/114/186
ThinkPad 600	$109/NA/NA

Compaq-Notebook

Model	Price
Armada 7700 Series,7300 Series,1510 Series	$79/134/232
Armada 7400, 7800, 1500C, 3500, 17XX	$88/113/219
Armada 8100, 8110, 8120, 4120, 4131,6230T	$88/136/246
Presario 1255, 1260, 1265, 1267	$83/113/186

Acer-Notebook

Model	Price
Extensa 365/367/368	$99/148/299
Extensa 501DX, 502T, 710TE, 711TE, 712TE	$NA/126/276

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- Seagate 9.1GB Ultra Wide SCSI Drive 10ms access time 7200 RPM
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- On Board GD5480 Video Card 2MB
- 40x Speed SCSI CD-ROM
- 15" SVGA Monitor
- On Board EtherExpress Pro+ 10/100
- 56Kbps External Fax Modem
- ATX NetServer Case with 300 Watt Power Supply
- 14 Device Bays, 5.25" x 6 & 3.5" x 8
- 104 keys Keyboard & PS/2 Mouse

PII-400MHz.....$2,220
PIII-450MHz.....$2,360
PIII-500MHz.....$2,685
PIII-550MHz.....$3,165

BigData BX²

- Intel L440GX Pentium II/III Server Board (Dual Processor/RAID Capable)
- 128MB ECC SDRAM/8MB EEPROM
- 1.44MB Floppy Drive
- Seagate ST39102LW 9.1GB Hard Drive Ultra 2 SCSI 10000 RPM
- On Board Adaptec AIC 7896 Dual Channel Ultra 2 SCSI Controller
- On Board GD5480 Video Card 2MB
- 40x Speed SCSI CD-ROM
- 15" SVGA Monitor
- On Board EtherExpress Pro 100+ LAN
- 56Kbps External Fax Modem
- ATX NetServer Case with 300 Watt Power Supply
- 14 Device Bays, 5.25" x 6 & 3.5" x 8
- 104 keys Keyboard & PS/2 Mouse

PII-400MHz.....$3,020
PIII-450MHz.....$3,160
PIII-500MHz.....$3,485
PIII-550MHz.....$3,965

Graphics Performance Never Looked So Hot!

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- Asus P2B-F Pentium II/ III Board
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- 1.44MB Floppy Drive
- IBM 10GB Hard Drive UDMA 33 9ms access time 7200 RPM
- 3Dlabs Oxygen VX1 GLINT R3 Card with 32MB SDRAM
- 44x Speed UDMA CD-ROM
- Optiquest V95 19" SVGA Monitor 1600x1280 resolution 0.26mm DP
- ATX Mid Tower Case w/Power Supply
- Fujitsu 104-keys Keyboard /w MS Mouse

PII-400MHz.....$2,125
PIII-450MHz.....$2,265
PIII-500MHz.....$2,590
PIII-550MHz.....$3.070

3D Station BX²

(Dual Processor Capable)

- Asus P2BDS Pentium II/ III Board
- 256MB SDRAM (100 MHz System Bus)
- 1.44MB Floppy Drive
- Seagate ST39102LW 9.1GB Hard Drive Ultra2SCSI,10000 RPM
- 3Dlabs Oxygen GMX Dual GLint GMX chipset with 96MB
- 44x Speed UDMA CD-ROM
- Viewsonic G810 21" SVGA Monitor 1600x1280 resolution 0.25mm DP
- ATX Mid-Tower Case w/Power Supply
- Fujitsu 104 keys Keyboard/w MS Mouse

PII-400MHz.....$6,145
PIII-450MHz.....$6,285
PIII-500MHz.....$6,610
PIII-550MHz.....$7,090

Video Cards

Leadtek	Winfast 2300	Permedia II chipset with 8MB PCI or AGP	[illegible]
	Winfast 2530	GLint MX + Gamma chip w/8MB+16MB AGP	$1700.00
	Winfast 3100	Dual GLint GMX chipset w/16MB+80MB AGP	$2585.00
DIAMOND	S320II-32	nVidia TNT2 processor 32MB AGP/TV Out	$318.00
	FireGL1	IBM 256 bit processor w/32MB AGP (SIMD ext.)	$1270.00
	FireGL 4000	Mitsubishi 3D Pro/2MP chipset 12MB+16MB	$1750.00
	Oxygen ACX	Permedia 2 processor with 8MB SGRAM AGP	$185.00
	Oxygen VX1	GLINT R3 processor with 32MB SDRAM AGP	$355.00
	Oxygen DP402	4 Oxygen chips w/32MB, Support Win95/NT	$1300.00
	Oxygen RPM	3D Labs RPM chipset w/64MB Support Dual Screen	$1445.00
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	Permedia Create	Permedia 3 processor with 32MB SDRAM AGP	Call
E&S	ECLIPSE II/32	AccelGraphics 3D chipset 32MB AGP	$1350.00
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	AccelGALAXY/52	RealImage 2000 chipset 52MB AGP	$1845.00
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	Tornado 3000	RealImage 3000 chipset 30+39MB 3D Memory	$2810.00

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	DPlus 100s	100s 21"/19.7"V 0.28mmAG 1600x1280@85Hz	$1610.00
	DPro 2020u	2020u 21"/19.7"V 0.25mmDP 1800x1440@80Hz	$2170.00
	DPro 91TXM	91TXM 21"/19.7"V 0.28mmAG 1600x1200@75Hz	$1545.00
NEC	E1100+	21"/19.6"V 0.28mmDP 1600x1200@77Hz	$1450.00
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	755CM	DesignJet 755CM A-E 300/600DPI Rollfeed 72MB	$11485.00
	1050C	DesignJet 1050C A-E Color 600DPI	$11485.00
	1055CM	DesignJet 1055CM A-E Color 600DPI	$15985.00
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	ViewSonic	P655	0.27mm	1280x1024	14.0"	30-70KHz	$ 336
	ViewSonic	GA655	0.27mm	1280x1024	14.0"	30-70KHz	$ 345
17"	OPTIQUEST	Q71	0.27mm	1280x1024	16.0"	30-70KHz	$ 365
	OPTIQUEST	Q73	0.26mm	1280x1024	15.97"	30-70KHz	$ 470
	OPTIQUEST	V73	0.26mm	1280x1024	15.8"	30-86KHz	$ 470
	OPTIQUEST	V75	0.26mm	1600x1280	16.0"	30-85KHz	$ 505
	ViewSonic	E771	0.27mm	1280x1024	16.0"	30-70KHz	$ 366
	ViewSonic	EA771	0.27mm	1280x1024	16.0"	30-70KHz	$ 500
	ViewSonic	G773	0.26mm	1280x1024	16.0"	30-70KHz	$ 495
	ViewSonic	GS771	0.27mm	1280x1024	16.0"	30-70KHz	$ 515
	ViewSonic	PS775	0.25mm	1600x1200	16.0"	30-95KHz	$ 640
	ViewSonic	PT771	0.25mm	1600x1280	16.0"	30-92KHz	$ 636
	ViewSonic	PT775	0.25mm	1600x1280	16.0"	30-96KHz	$ 710
19"	OPTIQUEST	V95	0.26mm	1600x1280	18.0"	30-95KHz	$ 525
	ViewSonic	E790	0.26mm	1600x1280	18.0"	30-85KHz	$ 685
	ViewSonic	G790	0.26mm	1600x1280	18.0"	30-95KHz	$ 710
	ViewSonic	PS790	0.26mm	1600x1280	18.0"	30-95KHz	$ 875
	ViewSonic	PT795	0.25mm	1920x1440	18.0"	30-110KHz	$1,155
21"	OPTIQUEST	V115	0.26mm	1600x1280	20.0"	30-95KHz	$1 255
	ViewSonic	G810	0.26mm	1600x1200	20.0"	30-89KHz	$1 286
	ViewSonic	P810	0.25mm	1600x1200	20.0"	30-95KHz	$1 400
	ViewSonic	P815	0.25mm	1800x1440	20.0"	30-115KHz	$1 596
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	ViewSonic	MB110	0.26mm	1600x1200	20.0"	30-85KHz	$1 385
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	ViewSonic	VPA138	0.30mm	1024x768	13.8"	30-62KHz	$1 300
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	ViewSonic	VPA150	0.30mm	1024x768	15.0"	30-62KHz	$1 825
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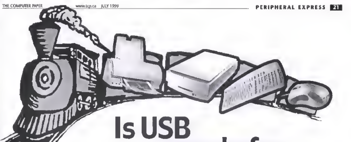

Is USB ready for prime time?

Manufacturers are rolling out all kinds of peripherals with universal serial bus connectors. We're on the verge of enjoying new levels of ease of use, but under some circumstances it's still plug and pray

By Rod Lamirand

Any talk about peripherals should include discussion about the state of universal serial bus (USB) connectivity Last year we prophesied that USB would become mainstream in late 1998 Although that prediction was premature we feel there are now enough products on the market to allow you some choice The reasons why you'd want to buy USB devices include the promise of easy installation and no hassle use But are those claims true? That's what we hope to answer in this article.

Everybody's jumping on the bus

USB was designed to allow hot-swapping, dual-speed data transmission power distribution and other functions considered useful The "universal" in USB refers to the original USB consortium's desire for a new way to connect pretty much any peripheral—a mouse, keyboard, scanner, digital camera, modem and speakers—to a PC. And, in fact, product developers are moving to make it a universal connection port. SuperDisk and Zip drives, home networks digital cameras modems—you name it, USB versions are either here or on their way Everybody and their peripheral is going USB

Scanners are leading the pack because they truly benefit from the ease of setup It looks like you won t be able to buy a scanner without USB by this time next year, except for models aimed at the professional graphic arts community

Digital cameras are also starting to incorporate USB, since image files can be moved off the camera much more quickly using USB than through a standard serial connection Digital camera users like to connect and disconnect often so USB s "hot plugability" is another reason for its inclusion on digital cameras

It has been argued that keyboards and mice will move to USB quickly However, there is little indication that this is the case. Such products are available but our current trusty input devices are so stable and so ubiquitous that this might be an area that remains resistant However they may gain favor with notebook computer users, particularly those who have other uses for their notebook's PS2 or serial port.

Companies like Best Data and Entrega have come out with USB networking products that allow you to set up a small peer-to-peer network Modem manufacturers are also making the move but it is unclear whether there is any benefit to be gained from USB modems

Gaming devices are increasingly available in USB versions, but they also have a regular 9 pin adapter just in case This is a good use of USB technology and should really get multi player applications moving Lastly look for a future review in these pages of the new crop of USB peripheral adapters. These products let you connect your old peripheral to a USB plug.

Like your serial port, USB sends and receives data in a stream like a queue of people moving through a single door Your parallel port, on the other hand has 25 pins so more information moves concurrently which is why it is called a "parallel" port connection However there is very little that either the parallel or serial ports have in common with USB other than their basic conceptual similarity Comparing your serial port to USB is like comparing one of those miniature steam engine trains in a children's park with the Toronto subway system

USB has a top speed of 12 Mbps (megabits per second or 12 million bits per second) and a slower speed of 1 5 Mbps The serial port in most PCs, on the other hand, transmits at a maximum of 115Kbps

The testing

We mixed and matched nine USB devices on three machines, a 450 MHz Pentium III-based PC, a 200 MHz Pentium MMX-based PC, and a Compaq Presario 1670 notebook, which uses a 350 MHz AMD-K6 2 processor with 3DNow The Pentium MMX system did not have built-in USB support so we installed the Entrega 2 Port USB Upgrade which is simply a PCI card with USB ports on it.

The most challenging situations were when three or four devices were connected to a USB hub We wanted to see if devices were properly recognized, applications worked as advertised, and whether or not there were conflicts The USB protocol calls for up to 127 devices to be connected to one computer. The system also allows for powered and non-powered devices and hubs USB is supposed to be hot swappable and should not require a system reboot When a fault occurs the software should not hang the whole system.

The results

Overall, USB is a work in progress Don't expect trouble-free use of USB products under all conditions It is true that USB peripherals are easier to install and remove, but USB isn't perfect. There were a number of difficulties that prove this is not a bulletproof system. Here are some details.

For the most part plugging a USB device into the back of your computer is painless If you don't use a hub then you are unlikely to have any difficulty Of course, if you don't use a hub you can only hook up one or two devices.

Although there were times when the computer needed a reboot to proceed (more a requirement of the software than the hardware) we were unable to create any problems this way It is true that USB products are supposed to be daisy-chainable (connected one after the other) but none of the products we received had built-in hubs. If such products have the kind of hub problems we had, then it's a good thing they don t

Both the Belkin and Entrega hubs had similar difficulties in similar situations On the Pentium III system neither hub could have the Microsoft Digital Sound System 80 and either one of the two flatbed scanners operating at the same time In each case, the hub lights went out This can occur when unpowered USB devices try to draw too much

Continued on page 34

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[illegible]	[illegible]CDS	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]
[illegible]	[illegible]CDS	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]
[illegible]	[illegible]CT	[illegible]	[illegible]	[illegible]	[illegible]			[illegible]
[illegible]	[illegible]CT	[illegible]	[illegible]	[illegible]	[illegible]			[illegible]
[illegible]	[illegible]CT	[illegible]	[illegible]	[illegible]	[illegible]			[illegible]
[illegible]	8000	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	8000	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	8000	[illegible]	[illegible]	[illegible]	[illegible]	24X	56K	[illegible]
[illegible]	3000	[illegible]	[illegible]	[illegible]	[illegible]	DVD	56K	[illegible]

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ThinkPad	[illegible]	[illegible]	32MB	[illegible]	12.1TFT	24X		[illegible]
ThinkPad	[illegible]	[illegible]	[illegible]	[illegible]	12.1TFT			[illegible]
ThinkPad	[illegible]	[illegible]	64MB	[illegible]	12.1TFT			[illegible]
ThinkPad	[illegible]	[illegible]	32MB	[illegible]	[illegible]TFT	24X		[illegible]
ThinkPad	[illegible]	[illegible]	64MB	[illegible]	[illegible]TFT	24X		[illegible]
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CTX	[illegible]	[illegible]	32MB	[illegible]	13.3TFT	[illegible]	56K	[illegible]
ACER	[illegible]	[illegible]	64MB	[illegible]	[illegible]	[illegible]	56K	[illegible]
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Model	Part #	Processor	Memory	STD/Max HDD	Ethernet	Controller	FormFactor	PFA
NF3000	8476300U	P-II 400	64/768MB	0GB/72.8GB	10/100Mbit	UW-SCSI	Tower	N/A
NF3000	8476310U	P-II 400	64/768MB	9.1/72.8GB	10/100Mbit	UW-SCSI	Tower	N/A
NF3000	8476420U	P-II 450	64/768MB	9.1/72.8GB	10/100Mbit	UW-SCSI	Tower	N/A
NF3000	8476430U	P-III 500	64/768MB	9.1/72.8GB	10/100Mbit	UW-SCSI	Tower	N/A
NF5000	[illegible]	P-II 450	64/2048MB	0GB/91GB	10/100Mbit	Dual UW	Tower	STD
NF5000	[illegible]	P-II 450	64/2048MB	0GB/91GB	10/100Mbit	Dual UW	Tower	STD
NF5000	[illegible]	P-III 500	64/2048MB	0GB/91GB	10/100Mbit	Dual UW	Tower	STD
NF5000	[illegible]	P-III 500	64/2048MB	0GB/91GB	10/100Mbit	Dual UW	Rack	STD
NF5500	866057U	P-II 450	128/2048MB	0GB/109GB	10/100Mbit	D-UW-RAID	Tower	STD
NF5500	866061U	P-III 500	128/2048MB	0GB/109GB	10/100Mbit	D-UW-RAID	Tower	STD
NF5500	866072U	P-II 450	256/2048MB	0GB/109GB	10/100Mbit	D-UW-RAID	Tower	STD
NF5500	866082U	P-III 500	256/2048MB	0GB/109GB	10/100Mbit	D-UW-RAID	Tower	STD
NF7000	866221Y	P-III Xeon 500	256/4096MB	0GB/109GB	10/100Mbit	D-UW-RAID	Tower	STD
NF7000	[illegible]	P-III Xeon 500	256/8192MB	0GB/72.8GB	10/100Mbit	D-UW RAID	Rack	STD

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ASUS P2B-F 233-450Mhz BX AGP 4DIMM ATX ... $181
ASUS P2B-D 233-450Mhz BX AGP DIMM ATX ... $378
ASUS P2B-S 333-450Mhz BX, AGP DIMM, ATX ... $468
ASUS P2B-DS 233-450Mhz BX, AGP SCSI, ATX ... $658
Abit BH6 233-450Mhz 440BX AGP, ATX ... $149
Abit BX6-II 233-450Mhz 440BX 4Dimm ATX ... $178
Intel Dual Pentium II Server L440GX, ATX ... $880
Intel Pentium II/III SE440BX ATX ... $168

Super Socket 7 Motherboard.

ASUS P5A/P5AB Pentium, Super7, AMD K6-2, AGP, ATX/AT $145 / $134
Shuttle 591P Pentium, Super 7 AMD K6-2 AGP AT $114
Tyan S1590S Pentium, Super 7 AMD K6-3 AGP AT $155
Aopen AX59Pro Pentium Super 7 AMD K6-2 AGP ATX $114

Mass Storage

Quantum Fireball CR 6.4GB / 8.4GB Ultra ATA/66 $159 / 198
Quantum Fireball KA 6.4GB / 9.1GB (7200 rpm) ... $224 / 276
Quantum Fireball KA 13.2GB / 18.4GB (7200 rpm) $375 / 489
WD AC22000 4.3GB / WD AC34300 8.4GB Ultra ATA $166 / 183
WD AC36400 6.4GB / WD AC31300 13.0GB Ultra ATA $199 / 318
Maxtor 6.4GB / 8.4GB Ultra ATA ... $178 / 188
Maxtor 10.2GB / 13.6GB Ultra ATA ... $238 / $258
Maxtor 17.2GB / 20.2GB Ultra ATA ... $335 / $451
Maxtor 18.1 GB Ultra ATA (7200) ... $281
IBM Deskstar 15.1/14.1GB Ultra ATA (7200) $298 / 379
IBM Deskstar 18.1/22.0GB Ultra ATA (7200) $468 / 548

CDR / Zip Drive

IOmega Zip 100MB Internal (incl. SCSI Adapter) / Ext SCSI $168 / 178
Zip 100MB Internal IDE Aw & Disk / Ext Parallel $119 / 133
Zip Drive 250MB Parallel or SCSI $279
Zip Disks 100MB Single Cartridge / 10 Pack ... $14 / 135
Zip Disks 250MB Single Cartridge / 3 Pack ... $28 / 78
Jaz Drive 2GB SCSI Int. / Ext (Driver on CD) ... $460 / 476
Jaz Disks 1GB / 2GB ... $129 / 135
OnStream 30GB Digital Drive IDE Int / Ext ... $445 / 508
OnStream 30GB Digital Drive SCSI Int ... $664
OnStream 30GB Digital Media ... $54
Hp SureStore CD-Writer Plus 7570i 8X/2W int ... $333
HP SureStore CD-Writer Plus 8100i 24/4W Int. (incl Software) ... $388
HP SureStore CD-Writer Plus 3000 6R/4W Int. w/SW ... $485
Panasonic CDR CW7502B 8R/4W w/SCSI Card & Software ... $390
Panasonic CDR CW7582B 8R/4W IDE w/Software ... $315
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Plextor Writer PX 3008 8/20 SCSI Int. / Ext. (Retail) ... $700 / 820
Yamaha CRW4416 16R/4X/4RW SCSI Int. (No Software) ... $400
Yamaha CRW4416S 16R/4X/4RW SCSI Int. (w/ Software) ... $438
Yamaha CRW4416S 16R/4X/4RW SCSI Ext (w/ Software) ... $525
Yamaha CRW4416E 16R/4X/4RW IDE Int. (w/ Software) ... $428

VIDEO CARDS

Matrox G400 [illegible] ... coming soon (Q2, 99) $Call
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Matrox Millennium G200-LE AGP 8MB (OEM) ... [illegible]
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ATI Rage Fury 128 AGP 32MB ... $249
ATI Xpert 128 AGP 16MB ... [illegible]
ATI Xpert 99 [illegible] AGP 8MB ... [illegible]
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ATI All in Wonder Pro AGP/PCI 8MB SGRAM ... [illegible]
ATI All In Wonder 128 AGP / PCI 16MB SGRAM ... [illegible]
ATI TV Tuner / ATI TV Wonder ... [illegible]
Diamond Viper V770 TNT2 16MB/32MB (OEM) ... [illegible]
Diamond Viper V770 TNT2 32MB Ultra (OEM) ... [illegible]
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Creative Graphic Blaster RIVA TNT 16MB (OEM)/(Retail) $148
Creative Graphic Blaster RIVA TNT2 32MB $Call
ASUS AGP RIVA TNT2 32MB (Retail) $289
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3Dfx AGP Voodoo III 3000 32MB (OEM) ... $189
3Dfx AGP Voodoo III 3000 32MB (OEM)/(Retail) $229 / 249

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3Com-USR V90 56k ISA Voice FaxModem (OEM) ... $101
3Com-USR V90 56K FaxModem Int. / Ext. (Retail) $177 / 198
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Aopen PCI / ISA 56k V90 Voice Faxmodem (Retail) $65 / 79

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Brother Laser Jet HL 1050 / HL 1040 600dpi 10ppm $368 / 459
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Epson DeskJet Stylus 440 Color 720 dpi (Windows Only) ... $108
Epson DeskJet Stylus 600 / 850 Color 1200 dpi $279 / 432
Epson Stylus Photo 740 720x720 ... $388
HP DeskJet 695C / 722C Color ... $258 / 399
HP DeskJet 880Cxi Color ... $435
HP LaserJet 1100 600dpi 8ppm 2MB ... $609
HP LaserJet 2100 600dpi 10ppm 4MB ... $1,058
HP 4000 4MB / 4000N 1200dpi 17ppm 8MB $1689 / $2238
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Umax Scanner 1220P 1200dpi w/Photo Deluxe (8.5"x11") ... $149
Agfa Snapscan 1212 1200dpi Flatbed / USB $179 / 212
Agfa Snapscan 1236S 1200dpi Flatbed ... $339

Multimedia

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Creative PC Works Fourpoint surround CSW1000 $138
Creative Cambridge Desktop Theater ... $378
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Altec Lansing ACS44 PowerCube System w/Subwoofer $97
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Micromedia M-4100 2way Speaker Systems $55
Juster 3D-155 Multimedia Subwoofer System $65
SoundBlaster ISA 16 / AWE 64 Sound Card (OEM) $38 / 55
SoundBlaster PCI 128 Mi PnP (OEM) / (Retail) .. $72 / 95
SoundBlaster PCI Live Value (OEM) / (Retail) 92 / 140
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Diamond PCI Monster MX300 Sound (OEM)/Retail ... $109 / $138
Yamaha ISA 16bit Sound Card (Retail) ... $25

CD / DVD Drive

Aopen CD-940E 40X / Aopen CD-948E 48X CD ROM $72 / 94
Creative Encore DVD 5 Drive Kit ... $299
Hitachi DVD 3 IDE Int. (Drive Only) ... $175
Toshiba XM6502B 40X EIDE Int ... $82
Toshiba M1202 DVD-3 IDE Int (Drive Only) ... $138
Toshiba XM6402 40X CD-ROM SCSI Int. ... $165
External Case for CD-ROM w/ES/IDE ... $78 / 98

Monitor

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Optiquest V75 17" 1600x1280 .25mm ... $548
Optiquest V95 19" 1600x1280 .26mm ... $658
Optiquest Q71 17" .27mm ... $355
ViewSonic PS775 17" .25mm ... $678
ViewSonic PS790 19" .25mm ... $878
SONY Multiscan CPD-200GS 17" .25mm ... $848
Multiscan CMD-400PS 19" 1848 x 1280 .25dpi ... $1328
Multiscan CMD-500PS 21" 1600 x 1280 .25dpi ... $2848
Multiscan GDM-F500 21" 1800 x 1600 .25dpi ... $3862
MicroScan 4P 15" .28mm N.I.L.R. ... $225
MicroScan 6P 19" .26mm ... $668
MicroScan 5P+ / 5GT 17" .26mm N.I.L.R. ... $429 / $560
MicroScan 6G 21" .28mm N.I.L.R. ... $1379
Diamond Plus 70 17" .25mm ... $678
Diamond Plus 72 17" .25mm 1600 x 1280 ... $758
Diamond Pro 900u 19" .25mm . $1168
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USB product notes

As described in the accompanying article "Is USB ready for prime time?" I looked at the behavior of nine USB peripherals in three test systems: two Intel-based PCs that I built and one AMD-powered notebook computer from Compaq

This review didn't look at comparative performance (In other words I didn't benchmark the USB device and compare the results to a similar model that used a serial or parallel connection.) The main purpose of the comparison was to see how well USB devices lived up to the claims of being simpler to configure and use than non USB devices. Following are additional notes on the USB devices that were part of the testing.

Two Port USB Upgrade
From Entrega Technologies Inc
25691 Atlantic Ocean Dr Lake Forest CA 92630
Tel 949-859-8866 http://www.entrega.com
Estimated street price $59.99

The Two Port USB Upgrade is a PCI card that you insert into your motherboard for USB connectivity It is simple and works well—as long as you have Windows 98 or 95 release 2.1

Seven Port USB Hub
From Entrega Technologies Inc
25691 Atlantic Ocean Dr, Lake Forest, CA 92630
Tel. 949-859 8866 http://www.entrega.com
Estimated street price $155.99

This is an attractive stackable hub However, you might want to get the four port version considering our recommendation about limiting the number of devices connected to your system. With recent price reductions, the four-port hub is available for a suggested retail price of $89

Leopard Pocket Modem
From Shark Multimedia Inc
3040 Oakmead Village Dr., Santa Clara, CA 95051
Tel 800-800-3321 http://www.sharkmm.com
Estimated street price. $129

This is the tiniest modem we have ever seen It is translucent green plastic like the new IMac computers, but is only compatible with Windows PCs If your laptop doesn't have an internal modem and you need your PC Card slots, this is a good choice.

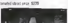
SnapScan 1212u
From Agfa Inc
77 Belfield Rd., Toronto ON M9W 1G6
http://www.agfa.ca
Estimated street price: $229

The SnapScan is an IMac or Windows 98 scanner that is also cased in translucent green plastic. It is perfect for home use

Scanjet 5200C
From Hewlett Packard (Canada) Ltd.
5150 Spectrum Way Mississauga ON L4W 5G1
Tel 800-SCANJET http://www.scanjet.hp com
Estimated street price $449

The ScanJet 5200C is a great scanner with great software You can initiate a scan from the software or by pressing a button on the scanner. Hewlett-Packard has done a good job with the features of the ScanJet line

Microsoft Digital Sound System 80
From Microsoft Canada
300-90 Matheson Blvd. W Mississauga, ON L5R 3R3
http://www.microsoft.com/canada/
Estimated street price $239



See our review "Great sounds from MS speaker system" in the May issue of *The Computer Paper*, or check out the back issue on our Web site for a full review of this system The long and short of it is this product will amaze your ears

Microsoft SideWinder Game Pad
From Microsoft Canada
300-90 Matheson Blvd W Mississauga ON L5R 3R3
http://www microsoft com/canada/
Estimated street price $106

Although rather limiting, for the right game (Motorcycle Madness), this game pad is very cool. You can steer simply by tilting the pad from side to side

Smart One USB 56K Modem
From Best Data Products Inc.
19748 Dearborn St. Chatsworth, CA 91311
Tel 818 773-9600 http://www.bestdata.com
Estimated retail price $149

The USB version of Best Data's Smart One line of 56K modems sets up easily The company has an offer that includes a free four-port hub with purchase of a USB 56K modem in select cities in Canada and the U.S until the end of June. A company spokesman told us there was a very high likelihood that the offer would be available after that date

ExpressBus for IMac/PC
From Belkin Components
Compton CA 90220
Tel. 310 898-1100 http://www belkin.com
Estimated retail price $89

Another translucent green peripheral, the Belkin four-port hub is inexpensive and looks good to boot

PageScanUSB
This is a great little product. However, its manufacturer, Storm Technology, has gone out of business.

—*Rod Lamirand*

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$1059 Cel 466
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$849

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Canon 5000 Color Printer	$259
Brother 1020 Laser, 10ppm	$369
Brother 1040 DX Laser, 10ppm	$429
Samsung 5100A Laser Printer, 3ppm	$429
HP Deskjet 695C Printer	$225
Lexmark 3200 Jet Printer	$219
HP 8200i Int. CD Rewriter	$435

Monitor

Proview 15"/17"/19"	$180/300/575
Acerview 54E/77E/78C	$199/325/445
Optiquest Q53/Q71	$255/349
Optiquest V73/V75	$459/479
Viewsonic E771/EA771	$375/479
Viewsonic G773	$479
Viewsonic PT775/PS790	$665/835
Panasonic S50/P50	$255/340
Panasonic SL70/SL90	$435/899
Sony 210GS/220GS	$529/685
Sony 200PS/400PS	$809/1299
NEC A700/E750/P750	$460/615/655
NEC A900/E900+	$640/989

Scanner

Acer 310S/620S	$150/169
Acer 310P/620P	$125/175
HP 4200C	$220
HP 5200C/6200C	$346/520
Mustek 600 USB/ 1200LS	$115/125
Canon 320P/620P	$199/187

Printer

Brother HL1020/1040DX	$369/429
Brother HL1050DX	$528
Brother MFC-4350C	$619
Brother MFC 7150C	$885
Canon BJC 1000/2000SE	$139/199
Canon BJC4400/5000	$179/279
Epson Stylus 440/640	$195/280
Epson Stylus 740	$340
Epson Stylus 800	$480
Epson Stylus Photo EX	$670
HP 695C/710C	$225/309
HP 1120CD	$659
HP Laserjet 1100/1100A	$590/725
HP Laserjet 2100/2100TN	$1020/1479
HP Laserjet 4000	$1650
HP Laserjet 4000N	$2125
Lexmark 1100	$125
Lexmark 3200	$219
Lexmark 5700	$283

Hard Drive

Maxtor 4.3/6.4GD UIDE	$139/189
Maxtor 8.4/10.2GD UIDE	$185/209
Maxtor 15.3/17.2GB UIDE	$283/379
Quantum 4.3/6.4GB UIDE	$133/159
Quantum 8.4/13.3GB UIDE	$185/239
Fujitsu 4.3/6.4GB UIDE	$138/165
Fujitsu 8.4/13GB UIDE	$179/275
WD 9G/18G (7200rpm)	$209/445
Seagate Cheetah U2W SCSI 9.1GB	$890
Seagate Cheetah U2W SCSI 18.2GB	$1499
Seagate Barracuda U2W SCSI 9.1GB	$670
Seagate Barracuda U2W SCSI 18.2GB	$1180
Quantum Viking II U2W SCSI 4.5GB	$345
Quantum Viking II U2W SCSI 9.1GB	$490
Quantum Atlas III U2W SCSI 9.1GB	$528
Quantum Atlas II U2W SCSI 18.2GB	$970

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USR ISDN Int/Ext	$320/395
Diamond Supra 56K Int. Voice	$62
Acer 56K V90 PCI INT Voice/Fax	$50
56K PCI Voice/Fax V90	$33

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Creative Lab 48X	$79
Toshiba 48X IDE/40X SCSI	$79/139
Creative Encore DVD5X Drive	$149
Creative Encore DVD6X KIT	$335
Acer DVD 6X Drive	$125
Toshiba DVD-2/DVD5 Drive	$135/165
Toshiba DVD-5 KIT	$269
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SB 128PCI	$57
Sound Blaster Live Value	$75
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Altec Lansing ACS 44 Speakers/Subwoofer	$95
Yamaha M20 w/Subwoofer	$120
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Yamaha 4416S Drive/Kit	$419/585
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ZIP Drive 100MB Ext.Parallel/SCSI	$165/199
ZIP Drive 250MB Ext. Parallel/SCSI	$275
JAZ 2GB SCSI Int/Ext	$405/530
ZIP Disk 100MB	$14
Panasonic LS120 120MB Super Floppy	$125
LS120Disk	$15
Seagate Tapestore 3200 Int.	$235
Seagate Tapestore 5000 Int.	$350
Seagate Tapestore 8000 Int.	$520

Network

3COM 3C905 10/100 Combo	$89
Intel 10/100 Combo	$69
NE2000 Compatible Combo	$20

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PCI Video, 4MB	$32
ATI Xpert 98(8M)/99(8M) AGP	$72/95
ATI Xpert 128(16) AGP	$128
ATI Rage 128 Fury 32M AGP	$236
ATI All-in-Wonder PRO 8MB AGP	$199
Diamond Viper 770 AGP 16MB	$179
Diamond Viper 770 Ultra 32MB	$339
Creative Banshee 16M	$115
Creative Riva TNT II AGP	$235
3D fx Voodoo 2000 (Retail)	$179
3D fx Voodoo 3000 (Retail)	$265

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ASUS P5A/P5AB	$135/120
ASUS P2B-F	$179
ASUS P2B-L/P2B-D	$255/310
ASUS P2B-S/P2B-LS	$466/525
ABIT BH6/BX6	$145/180

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TP390E C300/32M/3.2G/24X/56K/12.1 TFT	$2,699
TP390E PII300/64M/4.3G/24X/56K/14.1TFT	$3,725
TP570 PII333/64M/4.0G/56K/13.3TFT	$4,699
TP600 PII300/32M/4.0G/24X/56K/13.3TFT	$4,399
TP600 PII366/64M/6.4G/DVD/56K/13.3TFT	$5,799

Compaq

ARM1500C C266/32M/4.0G/24X/56K/12.1STN	$2,349
ARM1700 233/32M/3.2G/24X/56K/12.1CSTN	$2,599
ARM1700 233/32M/4.0G/24X/56K/12.1CSTN	$2,849
ARM1750 300/64M/4.0G/24X/56K/13.3TFT	$4,099
ARM4700 266/32M/6.0G/24X/13.3TFT	$4,149

Toshiba

4030CDS C300/64M/4.3/24X/56K/12.1DSTN	$2,399
4030CDT C300/64M/4.3/24X/56K/13.3TFT	$3,099
4060XCDT PII333/64M/6.0/24X/56K/14.1TFT	$3,829
4080XCDT PII366/64M/6.0/24X/56K/14.1TFT	$4,100
8000DVD PII300/64M/9.0/DVD/14.1TFT	$5,888

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Fujitsu

E342 C300/32M/3.2G/24X/56K/12.1 TFT	$2,199
E351 PII300/64M/4.3G/24X/56K/13.3 XGA	$3,249
L440B PII266/32M/6.0G/20X/56K/13.3 TFT	$3,099
E380 PII333/64M/6.4G/24X/56K/13.3 XGA	$3,825
E370 PII366/64M/6.4G/24X/56K/13.3 XGA	$4,550

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SIS 8MB 530 Chipset AGP Video (on board)
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-AOpen 104 Win98 P/S2 Keyboard
-Logitech 2B Mouse P/S2
-Acer (AOpen) 56K V.90 Int. Voice/Fax Modem PCI
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Soyo SY-5SSM Super7 Motherboard 1MB Cache A
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ASUS P5A-B-A AT Motherboard 3P,2I,1 AGP,512K	$129
GigaByte GA 5AX ATX Socket7 Motherboard ATX	$120
GigaByte GA-6BXC PII Motherboard ATX	$180
ABIT Pentium II BH6 Motherboard ATX	$150
ABIT Pentium II BX6II Motherboard ATX	$139
Shuttle HOT-591-P SuperSocket 7 Motherboard	$110
Shuttle HOT-661 P II/ P-III BX Motherboard	$189
Soyo SY 5SSM Super 7 Motherboard 1M Cache ATX	$109
Soyo SY-6IZM 443ZX P III Motherboard Pro ATX	$238

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Intel Pentium II 350 / 400MHz Retail	$270/ 315
Intel Pentium @450 /500MHz Retail	$410/ 720

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Toshiba 40X IDE CD-ROM Drive	$69
Delta 40X IDE CD-ROM Drive	$60
Plextor 32X Int. Ultra SCSI CD-ROM Drive	$189
Yamaha CRW4416 Int. CD Writer Kit	$579
Yamaha CRW4416 Int. CD Writer Driver only	$428
HP 8100i / 8110i IDE Int. CD ReWriter Drive	$379/ 385
HP 8200i IDE Int. CD-ReWriter Drive	$435

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Kodak DC-280 Digital. Casio CV700	$1150/ 585
Olympus D500L Digital Camera	$1100

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ATI 32MB Magnum OEM AGP2X Video Card	$215
ATI 8MB SGRAM All-In-Wonder Pro AGP	$188
ATI 8MB SRAM Xpert98 AGP Video Card	$69
Creative 16MB Riva TNT AGP Video Card	$129
Diamond 16MB Viper V770 AGP Video Card	$248
INTEL 8MB 740 Chipset AGP Video Card	$52
Matrox 8MB G200 Millennium AGP Video Card	$110
3Dfx Voodoo3 2000 AGP 16MB	$199
S3 Virge 4MB DX 3D PCI Video Card	$65
ATI TV Tuner ISA Card with FM Radio	$110
Matrox Rainbow Runner Studio for Mystique 220	$205
3Dfx Voodoo3 16MB V3000 Card w/TV Out	$289
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Zoltrix Face 2 Face Video Conference Kit Toshiba	$180
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3COM 3C900B TPO XL 10BaseT PCI Network Card	$80
3COM 3C905B TX PCI 10/100 Base Network Card	$72
GVC Ethernet PCI Combo Network Card	$30
IBM 10BaseT/100Base5 PCI Token Ring Network Card	$180
Intel EtherXpress Pro 10/100TX PCI Network Card	$86
Acer Ethernet Combo PCI PnP 10Mbps Card	$20
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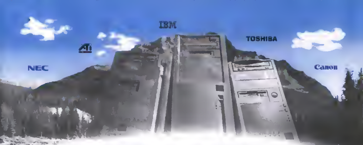

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- Logitech 3B Mouse P/S2
- Delta 40X IDE CD-ROM Drive
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Kingston Ethernet 8Port Stack Hub	$115
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Viewsonic 17" G773/ 19" PS790 SVGA Color	$485/ 870
TVM 17" UVGA .27dpi Digital Color Monitor	$325
Optiquest 17" Q71/ 17" V73/ 19" V95	$388/ 458/ 728
AOC 15" 17" SVGA Digital Color Monitor	$180/ 326
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Epson 440/ 640/ 740 Inkjet Color Printer	$206/ 299/ 339
Lexmark 1000 Inkjet Color Printer	$186
Okidata 8W Printer	$388
HP 3100 4000T Laserjet Printer	$1080/ 1545
HP 635 OfficeJet Multi-Function Centre	$688
Samsung MJ-4600C Inkjet Color Printer/Copier/Fax	$589
Samsung QL 5100A/ QL-6000 Laserjet Printer	$448/ 699
Samsung QL-6050/ QL 7000 Laserjet Printer	$536/ 1236
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HP 4200C Scanner	$299
UMAX 1220P FlatBed Scanner	$225

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IBM ThinkPad 600E/ 770Z	$4370/ 7259
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Toshiba 8000 PII 266/ 300/ 366	$4815/ 5426/ 6189
Compaq 1500C/ 1700/ 1750	$2266/ 2425/ 3746
Compaq 3500/ 7800	$3750/ 5510

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Yamaha M28 w/ subwoofer	$110
Altec Lansing ACS45 1/ ADA305	$115/ 236
Cambridge MicroWorks / SoundWorks 33W	$330/ 266
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USR 56K V.90 Int. Voice/Fax Modem (OEM)	$105
Smartlink 56K Int. V.90 Voice/Fax Modem	$45
Acer (AOpen) 56K V.90 Int. Voice/Fax Modem	$55
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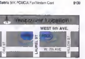


Lots of Parking on Laurel

Tabloid inkjets for big prints

If letter- or legal-size output isn't enough, you moy need o widemouth printer

By David Tanaka

A number of manufacturers now offer inkjets that will print on **11x17** inch (tabloid) paper. Prices for these printers range from a few hundred dollars to a few thousand dollars more than units that print on 8 5x11-inch (letter-size) paper or smaller. With that price spread comes an equally broad range of specifications and capabilities

Why tabloid?

An 11x17-inch printer can be useful in a number of circumstances For general office use a wide printer can output large spreadsheets, graphs and charts or other business documents like floor plans or schematics In a graphics or marketing department, it might be called on to output one-off or limited quantities of posters or bulletins Some like the Epson 3000, are designed to be used as a color proofing system for graphic artists. Many will also print on 13x19-inch "oversize" paper allowing edge-to-edge printing bleeds when the paper is trimmed down to 11x17-inch tabloid dimensions Some will also print on 17x22 inch paper or on banner paper up to 17x44 inches

In the home a tabloid printer can be called on to produce a number of personal projects, including maps, posters signs or enlargements of photographs These printers take up more space than a letter size inkjet, so the physical size may be an important variable when considering if you want one for home use

In this article we look at three tabloid inkjet printers This is not meant as a head to head comparison since these are very different products designed with different users in mind

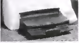
The Xerox DocuPrint C20 for example is very much like the letter-size inkjet printer you may already be familiar with except that it has been stretched to accommodate tabloid-size paper It would be suitable as a home or small office printer offering a good combination of image quality affordable price, and decent speed

The Hewlett-Packard 2500C, on the other hand is designed and built for office work, and isn t really intended to be used in a home or home office It has the highest duty cycle of the printers mentioned here the largest capacity for paper and big, individual color ink cartridges. It is the speed demon of the group, but is also the heaviest and occupies the most space

Epson's Color Stylus 3000 is designed specifically to be used by graphic artists as a color "comping" tool. It can t match the high monthly print volumes the HP 2500C is capable of, but it has the best color accuracy right out of the box, offering users a high degree of control over the color characteristics It also supports a wide variety of media made by Epson, including 17x44-inch banner paper and transparent stock for backlit signage

Xerox DocuPrint C20

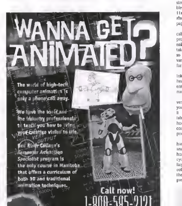
From Xerox Canada
Tel 800 275-9376 http://www.xerox.ca
Estimated street price. $1 199 ($1 799 for the NC20)



Xerox calls the DocuPrint C20 a small workgroup printer but it is probably better suited as a personal printer A similar model the NC20 is a better choice for network use for two reasons An Ethernet adapter is standard on the NC20 while it is an extra-cost option on the C20 The NC20 also comes with more standard memory The rest of the specifications are the same for both models

The C20 is rated at up to eight pages per minute (ppm) for black and up to 4 ppm for color both in draft mode. Image resolution is 600x600 dots per inch (dpi) while an enhanced setting will produce what Xerox calls "1 200 image quality" We found that

Continued on page **30**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Tabloid printer specificotions

	Epson Color Stylus 3000	Hewlett-Packard 2500C	Xerox DocuPrint C20
Resolution	1 440x720	600x600	600x600
Res. enhancement	1440 SuperFine	PhotoREt II	simulated 1200 dpi
Dimensions WxDxH cm	81x56 5x24	88.5x73 6x33 7	55 8x44 5x24 8
Dimensions WxDxH in	32x22 3x9 4	27x29x13.3	22x17 5x9 7
Weight kg (lb)	17 2 (37 8)	27 (60)	9 1 (20)
Ink system	CMYK	CMYK	CMYK or six-color
Cartridges	1 per color	1 per color	1 black/photo, 1 CMY
Max. rated print speed black	7 pages per min (ppm)	8 ppm	8 ppm
Duty cycle (pages)	75,000 total	12,000/mo	5 000/mo
Interfaces	parallel, serial	parallel	parallel
Network card	optional	optional	optional
Suggested retail price	$2,299	$1 899	$1 199
Web site	www.epson.com	www.hp.com/go/2500c	www.xerox.ca

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NOTEBOOK SPECIALS

Tabloid inkjets for big prints

Continued from page **28**

for printing typical office documents, such as letters, spreadsheets, and charts, the image quality was very good even on the standard setting. Text-only documents could be printed in just a few seconds when the C20 was set to draft mode, and the printing was quite acceptable

The printer emulates PostScript 2 as well as PCL printer languages The print software offers what Xerox calls "send once, print many," the idea being that multiple copies of a document will need to be processed once, cutting the overall print time

A year or two ago we would have been astounded by the photo output of this printer. However technology moves on, and while its photographic print quality is very good, other tabloid printers in this roundup did a better job The C20 produced the darkest and most contrasty print of a photographic image, and many shadow details apparent in printouts from the other two printers were lost. This, of course, could be corrected with image-editing software prior to printing.

The C20 uses a two-cartridge ink system, but offers the option of six-color printing if you substitute the black ink cartridge with a photo cartridge Rendering of photographic images improves with the Photo cartridge which provides a more subtle rendering of tones, completely eliminating the faint banding that was occasionally visible when using the main color cartridge with the black cartridge

Spot color printing was also quite good on this printer, although printing pages of mixed text and colors can be quite slow when the printer is set to the highest resolution as we discovered when we printed out 16 bar charts for a report the boss needed "right away"

The menu panel has some odd and annoying arrangements. For example the change cartridge button which moves the printhead to an accessible area of the printer is in the Tests menu rather than in the Supplies menu, which would be a more logical spot for it

Of the three the Xerox is most like a stretched version of a letter-size inkjet with comparable basic dimensions (apart from width) The Xerox has a 55.8x44.5 cm (22x17.5 in.) footprint is 24.6 cm (9.7 in.) high weighs just 9 kg (20 lb.), and it would fit well in a home office.

This printer is made for Xerox by Lexmark and is very similar in features to the Lexmark Optra 45

Continued on page **34**

Epson's affordable color tabloid

Epson Stylus Photo 1200
From Epson America
Estimated price US$600

This printer is based on the same inkjet technology as Epson's recently announced Stylus Photo 750 letter/legal-size printer. The Epson Stylus Photo 1200 is a tabloid-format printer with native USB serial and parallel connectivity It offers six-color printing via black and five-color ink cartridges. Epson says the 1200's six picoliter droplet size, 1 440x720 dot per inch resolution and Advanced AcuPhoto Halftoning deliver unsurpassed photo quality in a tabloid format printer in this price range. The printer is speedy, too. It can output a 4x6-inch photo in approximately one minute (Photo quality mode takes longer, however) and an 8x10-inch photo in only two minutes. It also takes paper sizes up to 13x44 inches. A roll paper holder is included with the printer. The software bundle includes Adobe Photoshop 5.0 LE. Epson says a PostScript option for this printer will be offered However, according to a review at Macintouch.com, the Epson PostScript RIP won't be ready until sometime this summer.

—*Graeme Bennett*

Epson, http://www.epson.com/

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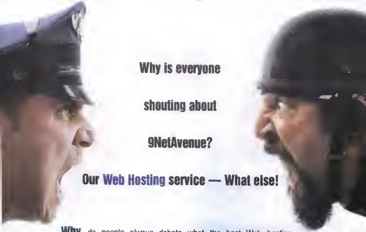

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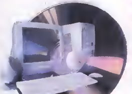

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Tabloid inkjets for big prints

Continued from page 30

HP 2500C

From Hewlett-Packard (Canada) Ltd.
Tel. 800-387-3867 http://www hp com/go/2500c
Estimated street price $1 899 ($2499 for the 2500 CM, which includes network connectivity)

The first thing that strikes you about the HP 2500C is its sheer size. This is the godzilla of inkjet printers In fact one of TCP's freelancers declined an invitation to review the unit because it was just too big for his home office. It stands 33 7 cm (13 3 in.) tall and occupies 68 5x73 6 cm (27x29 in) of desk surface while weighing in at 27 kg (60 lb)

This size gives it extra capacity to shine in an office environment however. The two paper trays hold a total of 400 sheets of paper, while a third tray, which also acts as the output bin, holds another 10 sheets The trays will accept paper up to 13x19 inches, allowing for full-bleed tabloid printing

The beefiness of this printer extends to the cartridges. Here we find four big individual cartridges—they look like little flasks—for cyan, magenta yellow and black. These were introduced on HP's 2000 model As part of HP's Smart Printing Technology each print head/cartridge includes a chip that indicates when each of the cartridges is running low on ink.

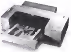
The duty cycle for this printer is rated at 12,000 pages per month more than double that of the Docuprint The 2500C is also one of the fastest inkjets we've tested It is rated at up to 9 ppm (draft setting, black) Along with the big print cartridges, it has larger print heads that provide a wider print swath This contributes to increased printing speed Even for high-resolution color photo output the printing times were surprisingly fast

Image quality is also very good. The printer uses HP's image enhancement technology called PhotoRet II color layering While the printer is rated at 600x600 dpi, the dot pattern looks finer then on the similarly rated Xerox DocuPrint C20 However, we did detect some fine banding in the mid-tones of the test photographs.

Like the Xerox product, the HP 2500C is classed as a workgroup printer but requires the purchase of a network card to be used on a network. If you intend to install this printer on a network, you might consider the HP 2500 CM model, which costs more, but has networking built in

Epson Color Stylus 3000

From Epson Canada
800-463-7766
http //www epson com
Suggested retail price $2,288



The Color Stylus 3000 is one of several Epson tabloid printers. It is advertised as a color comping system for graphic artists, and includes a software-based raster image processor (RIP) called StylusRIP, which processes PostScript Level 2 files for output on the printer. It also has extensive printer control settings that can be adjusted to compensate for image source (for example, a digital camera file setting increases color saturation) paper type, and other variables.

Like the HP 2500C, the Stylus 3000 is big so if you are contemplating it for your home-based studio remember that you'll need almost a metre of desk space for the printer It has an 81x56 5 cm (32x22 3 in) footprint, is 24 cm (9 4 in.) high, and weighs 17.2 kg (37 8 lb)

The Stylus 3000 also uses large, individual ink cartridges. The color cartridges are rated at 2 100 letter-size copies while the black cartridge is good for 3,800 pages (both at 360 dpi and five percent ink coverage)

The paper bin will hold up to 17x23 inch paper although the printer will accommodate continuous tractor feed paper or banner rolls The Stylus will print up to 17x44-inch sheets Epson makes a broad range of papers for the Stylus 3000, including a transparent stock for printing out a graphic for use in an illuminated sign. The printer software will reverse the image so it looks right when viewed through the transparent stock.

This printer can be used as a personal graphics tool, or one that might serve a small studio. A proofing system needs to offer color accuracy and control To test this

Continued on page 36

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Is USB ready for prime time?

Continued from page 21

power from the hub, but these peripherals had their own power supply. This problem didn't happen when we used the unpowered, sheet-fed Storm scanner.

On the Pentium MMX system with the PCI USB card, the HP scanner wouldn't work when playing the Microsoft Sound System demos, but the Agfa scanner would. But the Agfa scanner often had initializing difficulty on both the Pentiums PCs.

The Presario laptop worked well with everything except the Leopard Pocket Modem. In fact, the Leopard Pocket Modem and the Smart One USB modem both worked flawlessly when used without a hub yet rarely when used with either hub. There were no problems with the Microsoft Game Pad.

Other problems included various hung programs that usually just required a quick CTRL+ALT+DEL, though there were a couple of times when we tried to plug in a hub already connected to numerous peripherals, which hung the whole system. One annoying development was that some devices, noticeably the Microsoft Sound System, always required the Windows CD every time it was disconnected then reconnected. It was sometimes the case that the hubs would go down and need to be disconnected then reconnected to work.

Overall, the results indicate that there is inconsistent implementation of the USB protocol and/or quality components. As well, software is undoubtedly responsible for some difficulties. The long and the short of it is that USB is a real improvement over the serial and parallel ports but the claims are greater than the reality. Forget about attaching 127 devices and stick to three or maybe four. With the flood of USB products about to come on the market, it is still a case of caveat emptor. Various inconsistencies and minor irritations will undoubtedly occur.

Our tests show nothing conclusively. What they do reveal is that the Compaq had the least difficulty with USB devices, compared to the two clone PCs, and peripherals that are simple and use little bandwidth like the Microsoft SideWinder Game Pad, have few, if any, problems. We did not test this proposition, but believe that you get what you pay for. Poor quality USB products seem likely to have various problems. This may stem from the fact that extensive research is needed by each manufacturer to write solid drivers and good software.

If the computer industry wants consumers to move to the new USB standard and essentially replace their peripherals, they had better do more to ensure a problem-free computing experience. At this time, things look pretty good but there are still far too many anomalies. Can you trust your USB peripheral? Alone? Probably. In a group? Usually! ❑

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Tabloid inkjets for big prints

Continued from page 34

aspect of the printers, we created a file containing 25 Pantone CMYK color swatches, printed it out on each of the printers and compared the printout to the Pantone swatch book. Given the Epson's focus as a color graphics system, it is not surprising that of the three printers the Stylus rendered the colors most faithfully right out of the box.

Out of the box is probably not the way a graphic artist would want to use this printer, though, so Epson includes color adjustment settings for altering the brightness, contrast and saturation settings for the individual cyan, magenta and yellow inks. Alternatively, users can select presets that optimize the output for specific circumstances, such as photorealistic color, or to increase the contrast of images taken with a digital camera. The software supports ICM under Windows and ColorSync under the Mac OS.

The Color 3000 can also be used as a plotter, and comes with a printer utility called EpsonPlot! This utility will read HPGL plotter files and print them out on the Stylus.

Macs still rule in many graphics departments, and the Stylus comes with both a serial and parallel port to allow a PC and Mac to be connected to it simultaneously. Epson also offers a number of network interface cards, including a LocalTalk card and a few Ethernet variations.

For larger-scale proofing, Epson also has the Stylus Color 5000, which sells for around $20 000 and includes its own EFI Fiery image processing computer. ❑

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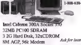

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8000DVD	PII 366	64	9.0G	DVD	N/A	14.1TFT	$5,899

IBM Notebook

TP I 1412 $2,490
- Celeron 366 CPU • 32MB RAM
- 4.0G H.D. • 24X CDROM
- 56K modem • 12.1TFT Screen

TP390E	PII 300	32	3.2G	24x	56K	13.1TFT	$3,299
TP390E	PII 333	64	6.4G	24x	56K	14.1TFT	$4,350
TP600	PII 300	32	4.0G	24x	56K	13.3TFT	$4,450
TP770Z	PII 366	128	14.1G	DVD	56K	14.1TFT	$7,299

Fujitsu Notebook

E 342 $2,249
- C 300 CPU • 32MB RAM
- 3.2G H.D. • 24X CDROM
- 56K modem • 12.1TFT Screen

E351	PII300	64	4.3G	24X	56K	13.3XGA	$3,249
E360	PII333	64	9.4G	24X	56K	13.3XGA	$3,849
E370	PII366	64	6.4G	24X	56K	13.3XGA	$4,560
L440	PII266B	32	4.0G	20X	56K	13.3TFT	$3,749

Notebooks

Monitor

Acerview 15" 54e, .28mm	$205
Acerview 17" 77e .27mm	$329
Acerview 17" 78c .26mm	$449
Optiquest 17" Q71 .27mm	$355
Optiquest 17" V73 .28mm	$469
Optiquest V75 .26mm	$485
Panasonic 17" SL70	$439
Panasonic 19" SL90	$829
Sony 210GS 17" .25mm	$529
Sony 400PS 19" .25mm	$1299
SVGA 19" .26mm	$599
Viewsonic 17" E771 .27mm	$375
Viewsonic 17" PT775 .25mm	$365
Viewsonic 17" EA771 .27mm	$489
Viewsonic 19" PS790 .25mm	$829

Scanner

Acer 620S / 620U	$179/195
HP 4200C USB	$265
HP Scanjet 5200C	$389
HP Scanjet 6200C	$519
Mustek 600USB/1200LS	$115/135
Canon 320P / 620p	$145/189

Hard Drive

Fujitsu 4.3GB Ultra DMA	$145
Fujitsu 6.4GB Ultra DMA	$169
Fujitsu 8.4GB Ultra DMA	$185
Fujitsu 13.1GB Ultra DMA	$275
Fujitsu 17.3GB Ultra DMA	$339
Quantum 4.3GB Ultra DMA	$139
Quantum 6.4GB Ultra DMA	$159
Quantum 8.4GB Ultra DMA	$189
Quantum 13.3GB Ultra DMA	$245
Western Digital 13GB U-DMA	$268
Western Digital 20GB U-DMA	$435

Backup Device

Panasonic 8x4 IDE	$318
Panasonic 8x4 SCSI	$389
HP 8100i / 8200i	$379/430
Yamaha 4416/ kit	$459/499
CDR Media 10Pk	$19
Zip Drive Int. IDE 100 MB	$99
Zip Disk 100 MB	$14
120MB Super Floppy	$129
LS 120 Disk	$16

Printer

Brother HL 1020	$365
Brother HL 1040DX	$435
Brother HL 1050DX	$529
Brother HL 1060	$599
Brother MFC-1970	$429
Brother MFC-4350MC	$629
Canon 1000 Color	$145
Canon 2000SE Color	$165
Canon 4400 Color	$179
Canon 5000 Color	$285
Epson Stylus 440	$205
Epson Stylus 640	$275
Epson Stylus 740	$375
Epson Stylus 850	$499
HP 695C Color	$225
HP 710C Color	$275
HP 1100 Laser printer	$599
HP 2100 Laser printer	$1035
HP 4000 Laser printer	$1659
Lexmark 1100 Color	$129
Lexmark 3200 Color	$225
Lexmark 5700 Color	$285

Video Card

Alliance PCI 4MB	$30
ATI Xpert@ AGP 8MB	$75
ATI Xpert 128 AGP 16MB	$135
ATI 128 Fury AGP 32 MB	$230
Creative Riva TNT2	$235
Creative Riva TNT2 Ultra	$200
Diamond Viper V770 AGP	$230
Diamond Viper V770 Ultra	$290
3Dfx Voodoo3 2000 AGP	$170
3Dfx Voodoo3 3000 AGP	$265

Multimedia

Acer 40x/48x CD ROM	$99/79
Toshiba 40x CD-ROM	$60
Acer DVD 6X	$129
Creative DVD 5x	$149
Creative DVD 6x	$189
Creative Encore 6x kit	$335
SB comp Sound card	$19
SoundBlaster 128 PCI	$59
SoundBlaster Live value	$79
GNT 5000A w/Subwoofer	$59
Altec Lansing ACS44	$95

Modem

56k V90 int. Voice/Fax	$35
Acer 56k V90 Int. Voice/Fax	$55
USR 56k PCI Voice V90	$80
USR 56K Int. Voice V90	$100
USR 56k Ext. Voice V90	$255

Motherboard

Super 7 VIA 512K	$99
ASUS P5AB, 512K	$128
ABIT BM6 AGP M/B	$149
ASUS P2BF AGP M/B	$185

SPECIALS

Alliance PCI Video 4MB	$30
ATI Xpert @Work AGP 4MB	$45
56k V90 int. Voice/Fax Modem	$35
Lexmark 3200 Color Printer	$225
Quantum 4.3GB UDMA Hard Drive	$130
Super 7 w/Video, Audio AGP Motherboard	$115
17" Q71 Monitor .27mm	$355
Adapter 2940UW SCSI Adapter	$299
Brother 1020 Laser Printer 10ppm	$365
USR 56k PCI Int. voice Fax Modem	$85
MS Windows 98 (with system purchase only)	$135

UPGRADE

Super 7 AGP Motherboard
32 SDRAM Memory PC100
PCI Video Card, w/4MB

Intel Pentium 233MMX	$245
AMD K6II 300/350	$265/269
AMD K6II 400/450	$295/339
ADM K6III 400/450	$465/535

All advertised prices are 1.3% cash discount. 2 years parts & labor depot warranty on all systems. All prices are subject to change without notice. All items are based on availability. Not responsible for typos.

Getting back to the basics of input

We don't often think about our mice and keyboards, but we should as these peripherals can make the difference between pleasant and painful computing

By Ross MacDonald

With all the hoopla surrounding newly accessible technologies like DVD, CD-RW and scanners little attention has been paid to what are arguably the most crucial devices attached to our computers: our mouse and keyboard

Mouse and keyboard makers, however realize the importance of these peripherals and have been steadily working behind the scenes to create a whole new generation of pointers and boards to make our computing experiences ever more efficient and pleasant So it is time to take a serious look at the meat and potatoes of interacting with our systems

Mice

Mice have evolved significantly from the single-button Mac mouse of yore through two- and even three-button variations And variation is the key to mouse husbandry these days as manufacturers have not only added features but moved the activation buttons to some pretty curious locations on the anatomy of their mice

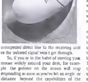
Of course it is still possible to buy mice with the standard two or three buttons positioned where your first, second and third fingers might fall But it is becoming more common to find ostensibly more ergonomic mice on which the buttons are positioned for the thumb, forefinger or even palm of the hand.

Add to these designs the introduction of a scrolling "wheel," textured and grip-coated buttons, and interfaces such as serial, PS/2, USB and cordless, and you have a dizzying array of choices It's no surprise then that prices can vary from $15 to more than $100 for this erstwhile basic device.

Cordless technology

Cordless mice have yet to gain any real popularity in spite of the fact that so many people say they'd love to reduce the number of cables and wires connecting to their computers. But cordless technology when applied to any peripheral, creates drawbacks most consumers aren't yet prepared to undertake

The most common version of cordless technology currently is infrared (IR), which operates on the same principle as most TV/VCR remote controls The trouble with infrared, however is that it requires a clear "line of sight" to work. The sending device (mouse, keyboard, printer, etc.) must have an



unimpeded direct line to the receiving unit or the infrared signal won t get through.

So, if you re in the habit of moving your mouse widely around your desk, for example the pointer on the screen will stop responding as soon as you've hit an angle or distance beyond the capabilities of the receiver Placing a book or other item on your desk between the sender and receiver will also cut off communication

However, this limitation has been largely alleviated by the more recent introduction of radio-frequency (RF) cordless technology which does not require a line of sight between sender and receiver. Plus, the issues of angle and range are essentially eliminated because radio waves transmit radially

However both IR and RF technologies require that a receiving unit be hooked up to the computer so, though you might have eliminated the cord between your mouse (or other peripheral) and your computer, you introduce a new one from the computer to the receiving unit (another box that you must find space for on your work area)

Yet another drawback to both cordless technologies is that the "cordless" half of the send/receive partnership requires batteries. While electronics engineers have created circuity that is increasingly power smart, batteries eventually fade and die so you'll need to always be prepared with spares for your cordless device or be willing to make unscheduled trips to the store

But back to mice .

Another thing to keep in mind when purchasing a new mouse is handedness Major peripheral manufacturers, like Logitech, have taken this into account and now produce several symmetrical mice as well as devices specifically for right or left handed users In most cases mouse-control software allows you to customize the button and wheel functions to accommodate user idiosyncrasies to some degree However lefties will always have a more limited choice of models

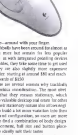
On a slightly more specialized note a few manufacturers have come up with special mice for portable users perhaps in recognition of the fact that many notebookers are unhappy with the pointing devices built in to their machines. The two most popular are the "joystick" type, familiar to IBM and Toshiba notebook users, and the touch pad type, familiar to almost everyone else I have used both extensively and find that they are equally effective after some practice.

Many consumers, however, dislike them and end up purchasing an external mouse or trackball to do the job. Mice and trackballs specially made for use with portables are essentially the same as desktop models but have a shorter cord and, often, software that reduces the degree of motion necessary to traverse the screen

Other mouse variations to watch for are models for beginners and children. These are basic units with few refinements or very large buttons for neophytes and little hands.

Trackballs

A trackball is basically a mouse turned upside down so the ball is exposed To direct the pointer you roll the ball—which is much larger and seated more firmly than the ball in



a mouse—around with your finger.

Trackballs have been around for almost as long as mice but remain far less popular because as with integrated pointing devices in portables, they take some time to get used to They are also slightly more expensive than mice starting at around $80 and reaching upwards of $150

There are several reasons why trackballs merit serious consideration. The most obvious is that they remain stationary, which frees up valuable desktop real estate for other uses Their stationary nature also allows engineers to build a lot more variation into their design and configuration, so users are more likely to find a combination of body design ball placement, ball size and button placement to ideally suit their tastes

As with mice, ergonomics have played a significant role in the design of trackballs Body design can vary from long slender and undulating to wide and corpulent. You'll find less variation in ball placement which is situated for rolling with the index finger on the majority of trackballs However, some are designed so the ball can be manipulated by the thumb or even the palm of the hand.

There seems to be an infinite variety of ball sizes but the rule of (ahem) thumb is that larger balls gather more momentum and are easier to roll They also require less rotation to cover more screen area. Some users however, find smaller balls to be easier to maneuver and more precise (for neophytes, on screen accuracy can initially be a very frustrating aspect of trackball use)

Finally button placement is almost as varied as body design Genuflecting once again to ergonomics designers have come up with multiple variations of button size and design with nearly every arrangement actually making sense What they all share is that the buttons and scrolling wheel quite naturally lie beneath one digit or another

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Viewsonic Monitor

E771 17" .27	$386
GT775 17" .25	$520
V95 19" .26	$638

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(while Stock Last)

Pentium III Dream Machine for Power User

Celeron WorkHorse

Intel Celeron CPU with 128K Cache
Asus [illegible] AGP ATX Mainboard
64MB PC100MHz SDRAM
Fujitsu 6.4GB Ultra DMA HDD
1.44MB 3.5" FDD
ATI 3D 8M AGP Video
15" N I F SVGA Monitor
107 Win 98 Keyboard
ATX Tower w/ 250W P/S
Logitech 2B Mouse + Pad
Acer 40x U DMA CD-ROM
3D Wave Stereo Sound
100W Stereo Speakers

64MB 6.4GB · 15" SVGA Monitor · ATI 8M Video · 40X CD-ROM

C-[illegible]MHz	938	$33/mo*
C-400MHz	998	$35/mo*
C-433MHz	1038	$37/mo*
C-[illegible]MHz	1098	$39/mo*

5-year service & 2-year parts warranty
Options
Windows 98SE +$138 / Acer 56K V.90 V/F/Modem +$90
128MB RAM (from 64M) +$80 / 8.4G HD (from 6.4G) +$30
17" SVGA [illegible] +$126 / MS Works Suite 99 +$140

Pentium III Power User

Intel Pentium II / III CPU with 512K Cache
Asus [illegible] 440ZX AGP ATX M/B
64MB 100MHz SDRAM
Fujitsu 8.4GB Ultra DMA HDD
1.44MB 3.5" FDD
ATI 3D 8M AGP Video
15" N I R SVGA Monitor
107 Win 98 Keyboard
ATX Tower w/ 250W P/S
Logitech 2B Mouse + Pad
Acer 40x U DMA CD-ROM
Acer 3D Wave Stereo Sound
100W Stereo Speakers

64MB 8.4GB · 15" SVGA Monitor · ATI 8M Video · 40X CD-ROM

P II-400	1138	$40/mo*
P III-450	1298	$46/mo*
P III-500	1598	$57/mo*
P III-550	2068	$74/mo*

5-year service & 2-year parts warranty
Options
Windows 98SE +$138 / Acer 56K V.90 V/F/Modem +$[illegible]
128MB RAM (from 64M) +$80 / 8.4G HD (from 6.4G) +$20
Viewsonic G71 17" +$170 / MS Office 2000 SBE +$300

Pentium III Dream Machine

Intel Pentium II / III CPU with 512K Cache
Asus P2B-F (Abit BH6) 440BX AGP M/B
64MB 100MHz SDRAM
Fujitsu 8.4GB Ultra DMA HDD
1.44MB 3.5" FDD
ATI Xpert 98 8M AGP Video
17" N I L-R SVGA Monitor
107 Win 98 Keyboard
ATX Tower w/ 250W P/S
Logitech Wheel Mouse
Panasonic DVD III Drive
SoundBlaster [illegible] 512
GNT 5000 Speakers w/Subwoofer
Acer 56K V.90 Voice/Fax Modem

64MB 8.4GB · 17" SVGA Monitor · ATI 8M Video · DVD III SB PCI 512 · 56K Modem

P II-400	1538	$55/mo*
P III-450	1678	$60/mo*
P III-500	1988	$71/mo*
P III-550	2468	$88/mo*

5-year service & 2-year parts warranty
Options
Windows 98SE +$138 / 128MB (from 64MB) +$80
10.2G (from 8.4G) +$40 / Viewsonic E771 17" +$98
100M ZIP Drive +$199 / HP 7570i CD-Writer +$318

Pentium III 3D Theatre

Intel Pentium II / III CPU w/ 512K Cache
Asus P2B-F (Abit BH6) 440BX AGP M/B
128MB PC100 SDRAM
10.2 GB Ultra DMA HDD
1.44MB 3.5" FDD
Diamond V770 TNT2 16M AGP
Viewsonic E771 17" SVGA Monitor
Fujitsu 104 Key Keyboard
ATX Tower w/250W P/S
Logitech Wheel Mouse
Panasonic DVD III Drive
SoundBlaster Live Value
GNT 5000 Spkrs w/Subwoofer
Acer 56K V.90 Modem

128 MB 10.2 GB · DVD-III SB Live · E771 17" Monitor · Diamond 16M TNT2

P II-400	1798	$64/mo*
P III-450	1948	$70/mo*
P III-500	2248	$81/mo*
P III-550	2728	$98/mo*

5-year service & 2-year parts warranty
Options
Windows 98SE +$138 / 256MB (from 128MB) +$150
13.3G (from 10.2G) +$50 / Viewsonic V95 19" +$250
100M ZIP Drive +$199 / HP 8200i CD-Writer +$428

Home/ Office Essential

Celeron Home Office

Intel Celeron CPU with 128K Cache
Intel 440 LX/ZX-based AGP M/B
32MB PC100 SDRAM
Fujitsu 4.3GB Ultra DMA HDD
1.44MB 3.5" FDD
ATI 3D 8M AGP video
15" N I I R SVGA Monitor
104 (Windows 95) Keyboard
Mid Tower w/ 250W P/S
Mouse + Pad
Acer 40x U DMA CD-ROM
3D Stereo Sound
100W Stereo Speakers

32MB 4.3GB · 15" SVGA Monitor · 40X CD-ROM

C-366MHz	828
C-400MHz	898
C-433MHz	938
C-466MHz	998

3-year service & 1-year parts warranty
Options Windows 98SE +$138 / 56K v.90 modem +$50
64MRAM (from 32M) +$45 / 8.4G HD (from 4.3G) +$30
17" SVGA Monitor +$126 / MS Works Suite 99 +$148

AMD Home Office

AMD K6-II-3D MMX CPU
Super 7 AGP Motherboard, 512K Cache
32MB PC100 SDRAM
4.3GB Ultra DMA HDD
1.44MB 3.5" FDD
ATI [illegible] 8M AGP
15" N-I L R SVGA Monitor
107 Win 98 Keyboard
15" Tower w/ 250W P/S
2B Mouse + Pad
Acer 40x U DMA CD-ROM
Acer 3D Wave Stereo Sound
100W Amplified Stereo Speakers

32MB 4.3GB · 15" SVGA Monitor · 40X CD-ROM

K6-II-350	798
K6-II-400	868
K6-II-450	928

3-year service & 1-year parts warranty
Options Windows 98SE +$138 / 56K v.90 modem +$50
64MB RAM (from 32MB) +$45 / 6.4G HD (from 4.3G) +$30
17" SVGA Monitor +$120 / MS Office 2000 SBE +$300

AMD Power House

AMD Power House

AMD K6-II / III 3D MMX CPU
Asus P5A-B AGP Motherboard 512K
64MB PC100 SD RAM
6.4GB Ultra DMA HDD
1.44MB 3.5" FDD
ATI Xpert 98 8M AGP
15" N I L R SVGA Monitor
107 Win 98 Keyboard
15" Tower w/250W P/S
Logitech 2B Mouse
Panasonic DVD III Drive
SoundBlaster PCI 128
GNT 5000 Spkrs w/Subwoofer

64MB 6.4GB · 15" SVGA Monitor · DVD III SB PCI 128

K6-II-400	1098	$39/mo
K6-II-450	1168	$42/mo
K6-III-400	1268	$45/mo
K6-III-450	1348	$48/mo

3-year service & 1-year parts warranty
Options
Windows 98SE +$188 / 56K V.90 V/F/Modem +$50
128MB RAM (from 64MB) +$80 / 8.4G HD (from 6.4G) +$20
Viewsonic G71 17" +$170 / Voodoo3 3000 16M AGP +$218

Upgrade Your PC

Intel Celeron Upgrade

- Intel Celeron CPU with 128K Cache
- Intel 440LX-based AGP M/B
- 3D Stereo Sound

C-366	C-400	C-433	C-466
$268	$318	$348	$398

AMD K6-II Upgrade

- AMD K6-II 3D CPU
- Super 7 AGP Mainboard
- 32M PC100MHz SDRAM

K6-II-350	K6-II-400	K6-II-450
$268	$318	$368

Options:
56K V.90 Modem +$50 / 32/64M SDRAM +$45 / 80
4.3/6.4 HDD +$148 / 178 / PS/2 & Adapter +$18

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30 pin Parity 4M / 72pin EDO 8M	$15/22
72 pin EDO 16M / 32M	$40/80
72 pin Reg 8M / 16M / 32M	$28/40/80
72 pin Parity 8M / 16M / 32M	$40/65/120
PC100 SDRAM 32M / 64M	$40/78
PC100 SDRAM 128M / 256M	$148/368
ECC PC100 SDRAM 64M / 128M	$98/178
AMD CPU	
K6-II-350 / 400 / 450	$86/128/175
K6-III-400 / 450	$278/348
Intel CPU	
Celeron 366/400/433/466	$120/158/198/240
P-II 350 / 400 / 450	$296/388/408
P III-450 / 500 / 550	[illegible]

Motherboards

Pentium / K6-II / K6-III Motherboard	
Asus P5A / P5A-A (AGP/ ATX)	$138/146
Asus P5A-B / P5A-B-A (AGP/ AT)	$128/138
Vigor (Super 7) AGP / AT	$96
P-II / P-III Motherboard	
Abit BH6 / [illegible]	$145/188
Asus MEL (S370) / P2-99 (440ZX)	$138/146
Asus P2B-F / P2B-D	$180/378
Asus P2BS w/ U2W SCSI	$450
Asus P2BDS Dual/ U2W SCSI	$650
Gigabyte [illegible] (Dual Intel)	[illegible]
Intel SE440BX2	$199
Intel T440BX / SCSI	$478
Intel N440BX Dual / U2W SCSI	$770
Vigor 440ZX	$128
ECS Socket 370 w/sound/Video	$138

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10.1/ 18G U-DMA 7200 rpm	$306/498
4.5 / 9G [illegible] U2W SCSI	[illegible]
18G U2W SCSI 7200/10000rpm	$1038/1286
Maxtor (Ultra DMA IDE)	
8.4 / 13.6 / 17.2G	$189/268/346
10.2G 7200 rpm	$298
Quantum	
[illegible] 8.4 13.3G	$145/188/196/288
KA [illegible] 3.6 / 18.2G	$318/255/370/488
Viking II 4.5 / 9.1G U2W SCSI	$388/498
Atlas IV 9.1 / 18.2G U2W SCSI	$630/1030
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Barr 9 / 18G U2W SCSI	$580/1080
Cheetah 9 / 18G U2W SCSI	$820/1419
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6.4 / 8.4 / 10.2 / 13G	$199/208/228/278
9 / 18G U-DMA66 7200rpm	$306/428
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1505 / 2910 / 2930	$70/156/180
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2940 U2W / U2W Kit	$328/418
Tekram 310 / 390 SCSI Adapter	$68/98

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Seagate 8GB TR-4 Int IDE/SCSI	$348/408
Seagate 4GB DAT SCSI Int	$308

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[illegible]	[illegible]
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Yamaha 4416 Ext. SCSI Kit	$650
BASF/Sony CD-R (10pc)	$16.8/23.8
BASF / Sony CD-Rewritable	$8/10

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Panasonic 32x / Asus 40x / 50x	$68/80/98
Toshiba 40x / 50x	$78/96
Pioneer 36x SCSI CD-ROM	$96
Creative Encore DVD 4 [illegible]	[illegible]
Panasonic / Sony DVD III (5x)	$138/168
Pioneer 6x DVD IDE / SCSI	$180/218
Sigma DVD Controller PCI	$136
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SoundBlaster 16 3D / PCI 128	$38/[illegible]
SoundBlaster PCI 512	$80
SoundBlaster Live / Live Value	$268/98

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ZIP 100M / 250M Disc	$13.80/[illegible]
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JAZ SCSI to Parallel Adapter	$80
LS120 Super FDD Int. / Ext.	$118/208
LS120 Disc	$13.80

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USR V.90 Ext. Para / USB	$205/268
USR ISDN 128K Int	$268
Creative WebCam Para / USB	$108/148
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Logitech QuickCam Pro Para/ USB	$168/198
USR BigPicture Video Kit	$216
Toshiba Camera & Capture card	$139
Video Capture & TV Tuner	$99

Spkr/ Mice/ KB/ Cases

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Altec AC[illegible]	[illegible]
Creative Cambridge SoundWorks	$128/198/338
Creative 3D Theatre 5.1	$99
Yamaha M15 Spkr/ M10 Subwfr	$78/128
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Logitech 2B/ 3B/ wheel mouse	$12/15/20
Logitech mouseman 4B / mouseman+4B	$68/79
Logitech Trackman Marble / FX	$65/118
MS Intellimouse / USB	$38/68
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Logitech Cordless Kit & Wheelmouse	$129
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AT 15"/19" Case & P/S	$40/50
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Canon 6000 / 7000	$377/488
Epson 440/ 640/ 740/ 850	$188/278/368/510
Epson 900/ 1520/ 3000	$638/718/1768
Epson Photo 700/ 750	$308/438
HP 610C/ 710C/ 722C/ 895C	$230/278/348/530
HP 1120C/2000C/2000CN	$650/968/1418
Lexmark 3200 / 5700/ Z51	$228/268/368
Laser Printer	
[illegible] DX (-$0/ $30)	$370/388
Canon L[illegible] 60/1760N	$1438/2288
HP 1100/2100/2100TN	$598/1028/1438
HP 4050/4050N/4050TN	$1398/2068/2288
HP 5000/5000N/5000GN	$2088/2588/3688
HP 8000/8100	$3258/3868
HP 4500/8500 Color Laser	$3668/8668
Lexmark Optra E / E310	$510/598
Lexmark Optra 1625 / 1625N	$1438/1888
Lexmark Optra 1855 / 1855N	$1538/2088
Samsung 5100/6050/6060	$448/518/718
Samsung 7000/7000NC	$1298/1648

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AGFA Snapscan 1212P/ 1212U	$178/198
Canon [illegible]	$98/175
Epson 800E/ 800A/ 800P	$868/1038/1488
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V73	17"	.26mm	1280x1024	$448
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GT775	17"	.25mm	1600x1280	$528
PT771	17"	.25mm	1600x1280	$588
PT775	17"	.25mm	1600x1280	$688
PS775	17"	.25mm	1600x1280	$618
V95	19"	.26mm	[illegible]	$638
G790	19"	.26mm	1600x1280	$708
PS790	19"	.25mm	1600x1280	$838
PT795	19"	.25mm	1800x1440	$1088
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3COM 3C16710 OfficeConnect 8/TPM	$488
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3COM 3C985B-SX Gigabit Server Card	$1088
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Intel InBusiness SH101TX8 8 Port Hub 10/100	$330
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MegaHertz 3CXFE575BT 10/100 Cardbus	$218
MegaHertz 3C574TX 10/100 LAN	$220
MegaHertz 3CCM156B 56K Modem	$258
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MegaHertz 3CXEM556C 56K Modem + 10BT/2	$398
MegaHertz 3CCFEM556 56K Modem + 10/100	$445
MegaHertz 52803/52900 128K ISDN	$469/520
Viking 56K PCMCIA Fax Modem V.90	$178
Netgear FA410 10/100 BT	$128
Xircom Realport 56K V.90 + 10/100 BT	$488
Xircom Realport 10/100 Ethernet Cardbus	$210
Xircom Realport RM56 56K V.90 Mod	$195
Xircom CM56/CM56G 56K Fax Modem	$180/268
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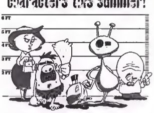

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Getting back to the basics of input

Continued from page 41

However, you might find that the left-click button is under your thumb on one model but under your index finger on another. Some trackballs even make the ball itself a button by suspending it on springs so it clicks when pressed down. This variety of design means almost everyone can find a version to ideally suit their needs, wants or habits

As with mice trackballs come in both flavors of cordless (IR and RF) And they are far better suited to these technologies than mice because they are stationary Line-of sight can still be a a problem if you put something on your desk between an IR sender and receiver, but angle and range aren t an issue Dealing with batteries and accommodating receiving units somewhere on your desk, however, are still issues.

Keyboards

Usually content with whatever keyboard is included with their computer purchase, few computerists put much thought into this crucial device The undulating ergonomic keyboards that hit the market a few years ago were a genuine departure from the traditional board and their promise of reduced fatigue and physical strain held some appeal for chronic typists In recent years, keyboard enhancements have been largely driven by the popularity of the Internet

Quick keys

Under the umbrella category of Internet keyboards, most manufacturers have developed a variety of programmable function keys to quickly launch applications link to favorite Web sites, or automate frequent commands.

Apart from a variety of ergonomic shapes, other tailored features can include tilt, wrist rests of varying design and composition and even dimensions—some boards are specifically designed to maximize desk space while maintaining full-sized keys.

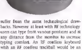
Though rare, it is still possible to find keyboards that have a built-in pointing device The most common among these employ a trackball or joystick-type controller However, these not only increase the size of the board, they are usually miniaturized to fit onto the board and are less satisfactory than separate full-sized pointer devices.

Keyboard feel'

It is also important to test the "travel and feedback" of a keyboard Travel is the distance each key moves when you hit it It has long been possible to make keyboards with zero travel (like a touch-pad) but consumer testing has established that most people like keys to have some travel. Conversely, too much travel—especially if the user has never used a typewriter—can slow down typing or force errors

Feedback is the combination of tactile and aural sensations the user gets while typing. Compaq once tested a completely silent keyboard but, as with zero travel nobody liked it because there was no aural confirmation that a letter had been typed. Compaq ended up building in an artificial "click" for each keystroke to correct this. The sound and feel of a keyboard can greatly influence not only comfort of typing but the ability to type well.

As with mice and trackballs, cordless keyboards have been around for a long time and suffer from the same technological drawbacks. However at least with RF technology users can type from various positions and at any distance from the monitor to increase typing comfort. An RF cordless keyboard with an RF cordless trackball would be an ideal combination for those to whom comfort is paramount and cost is no object. ❑



Electronic ink has real-world debut

NB—Electronic ink, a breakthrough technology that could have a big effect on newspapers, books and signs has become a real product well ahead of expectations

E Ink of Cambridge, Mass , has announced that a handful of J C. Penney stores are using its signs for displays—the first time electronic ink will make it out of the lab E Ink was launched in 1997 based on discoveries made at the Massachusetts Institute of Technology

Electronic ink is real ink on paper or a similarly thin display But the ink can be changed just like letters on a computer screen One goal is of electronic ink is to make a book that looks and feels exactly like today's books except that its contents can be changed by downloading new material onto the paper

The concept seemed far-fetched just a year ago "It s come from an experiment in a chemistry lab to a clearly defined product," says Dennis Wong of McCann Erickson Venture Group, an E Ink investor.

The first sign, in the sports clothing department of a Marlborough, Mass , Penney store is about as thick as the brim of a baseball cap and consumes less energy than a light bulb

To a shopper, it looks like a large printed sign But every few seconds the sign changes. Unlike a typical electronic display E Ink s looks the same from any angle and in any light J C. Penney technology manager Ed Sample says

The U S retailer also plans signs in Dallas and Chicago stores.

E Ink, which is still a private company is continuing its drive to develop books and newspapers. E Ink eventually could make it possible to buy one newspaper, then have it updated daily via radio signals. ❑

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Living with a tabloid inkjet

By Jean Allen-Ikeson

With my three boys churning out school projects, and me busy running a small greenhouse supply business and writing for *The Computer Paper*, my printer has to be a jack-of all trades, and capable of printing fast enough to keep me off the mint juleps. After using my Hewlett-Packard DeskJet 1120C color tabloid printer for about a year, I would gladly nominate it as a "super" jack-of-all-trades.

The 1120C's print quality is so good I use it to output the master copy of a newsletter I produce for an orchid society And since my eldest asked if he could "borrow" my HP 5MP LaserJet, I have had no separation anxiety Even though it is an inkjet, the 1120C prints such crisp text that it is difficult to tell the difference between its output and that from the laser printer without a magnifying glass.

Life hasn't always been this good When I bought my first color inkjet, an Epson 720 dot per inch (dpi) printer, four or five years ago—when the dinosaurs still roamed southern Ontario—I drooled over the output (even though my kids grew several inches and the seasons changed while I waited for it to format and output high resolution color)

While my 1120C takes more than a twinkle of the eye to print a full color page, it is dramatically faster than the old Epson And it prints as well or better, on premium inkjet paper as its predecessor did on expensive specialty 720 dpi paper.

After a year of using the tabloid printer, I have yet to replace an ink cartridge—which is an improvement on my first experience with inkjet printers.

The speed quality and number of copies per cartridge are no accident This printer is part of HP's "professional" series, which means it qualifies as a small business printer. Its street price is a bit over $600 but its speed and the convenience of tabloid printing make it worth every dollar.

School projects

A favorite family resource and research tool for school projects is the National Geographic CD-ROM of maps and magazines. One of my sons recently used it to find an article map and wonderful photos for his Grade 4 project on prairie dogs. The 1120C printed out the 25-page article (more than 50 percent of which was photographs) in "normal" resolution in about 20 minutes My son then used the text as a reference and cut out the photos to enhance his written report and to add to a poster for his oral presentation

For another project, we printed out a tabloid size (11x17 inches) map of Medieval England in "best" resolution. Using the 1120C, even the small print was very readable—a result we could not achieve in the past with the consumer inkjet and a maximum paper size of 8.5x11 inches.

Business too

There is nothing more annoying than trying to splice together an image printed across several letter size pages—the end result always looks spliced. But that problem has become a distant memory because printing posters is where tabloid printers really excel.

For really great looking posters, I've been using the new poster boards with bright, preprinted borders. An 11x17-inch printout fits perfectly within the border. I've used this technique to promote my booth at garden shows I printed the name of my greenhouse company in a large font on a tabloid-size sheet and attached it to a posterboard with a bright rainbow border. It looked terrific

At these shows, I get many requests for additional literature, which are now easier to fill than ever. With the 1120C, printing out addressed, 10x13-inch envelopes is a piece of cake.

The only drawback to this printer is that it takes up more space on my desk. Otherwise, I think I'm in love ❑

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SuperMicro P6DBS 440BX Dual PII/PIII UW scsi	$550
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intel AMD

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Intel Xeon P III 550/512k	$1[illegible]
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AMD K6-II 380 /400 /450 /475 3D	$125/130/170/25[illegible]
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Epson

Stylus 440/640/740	$160/255/36P
Stylus 800 (1440dpi)/ 850 (PC/Mac)	$420/520
Photo Stylus 700 720x720	$530

Brother

HL1020/1800DX/1650DX	$370/440/530
Toner Tx 00 / Tn200	$36

Okidata

OL8W 600dpi laser	$370
9pin 320/321/390/391	$450/610/480/630
24pin 520 570 590/591	$540/730/620/900

CASE / KB /MOUSE / Cables

AT 15" 19" 23" case&power	$38/55 90
ATX 15"/19"/23" case &power	$55/80/95
InWin ATX case 17" / 24" &power	$80/100
Cho-II ATX 19" / Server 2-in-1 Redundant	$80/460
Landmark 19" ATX-200 /ATX 290 plastic	$80/120
Mouse / Logitech 2B / Logitech 3B (PS2)	$8/12/18
MS IntelliMouse PS/2 / USB	$35/90
Logitech MouseMan 3B / MouseMan+	$30/60
Logitech Marble mouse+ /USB	$65/90
Logitech Internet KB / cordless mouse & KB	$43/139
104KB /Fujitsu4725 / Fujitsu 4725	$12/19/60
MS Natural / TouchPad KB	$40/65
MS natural USB / U90 keyboard	$75 / 30
Scsi cable/ Wide scsi cable	$10/15
over 4 devices cable (scsi/UW scsi)	$35
Ext. Scsi cable / 25p-HD50p/25p-HD68p	$25/40 /40
ext Scsi cable (any pin to Centronics)	$40
Rack mounting IDE/SCSI drawer	$22/25
Rack mounting UW scsi	$30
Printer cables 6ft/10ft/25ft.	$5/10/18
Modem others/Laplink cables	$10/15
CorelDraw 8 /WinFaxPro v8.	$300/138
AntiVirus Norton/McCafee	$69/69
Partition Magic V.3 Norton Utilities	$85/100
Simply Speaking Gold / Simply Accounting	$169

MULTIMEDIA

DVD KITS

Hitachi DVD3 / Toshiba DVD5	$140/150
Creative DVD4 Encore all kit(retail)	$320
Toshiba DVD 2 / Black DVD 3 drive	$120/200
Hollywood+ decordable card	$110

SOUND CARD

16bit / 32bit sound card	$18/24
SoundBlaster 16 /AWE64 PCI	$35/50
SB PCI 128 / PCI 256 Value / Live	$65/80/200
Diamond Mx300 / TurtleBeach	$110/$120

CD-ROM

Creative 48x /Toshiba 32x .Slide / EPO 40x	$75/70/60
Acer 40x / EPO 48x / Black Toshiba 32x	$65/70/100
40x mini Pioneer / Toshiba 40x pass	$110 /130
Backpack 16x parallel slimmed with sound	$200

CD WRITER

HP 7200i ide Rewriter Retail 16x4x2x	$250
HP 8100i /8110i ide Rewriter 24x4x2x	$375/385
HP 7570i / 8200i	$320/420
Sony CRX100 kit / CRX120 kit	$395/440
Yamaha 4416s scsi 16x4x4ain / kit /E	$420/470/450
Plextor 20x8x4x int/ext	$610/720
writable cd-disk /Sony	$1.80/2.5
Rewritable cd-disk/Sony	$16/20

SPEAKER

100W/160W	$12/$25
GNT5000 subwoofer kit / Eastern 4010	$60/75
Rocklive 276A Subwoofer w/4 spkr	$65
Yamaha M20 w/Sub kit / MT10	$115/180
Altec ACS44/45 1/48/ADA305	$95/125/195/240
Creative MicroWorks /PCWorks 4point	$340/140
MicroPhone / Headset	$8/15

TITLES (w/CD-ROM kit or system ONLY)

MS Suit'99 kit (Words,Works, Encarta'99 Money)	$120
Corel WP Suit 8 / WP 2000	$30/80
MS Office 2000 Pro / Small bus	$500/300
Office/Access 15 user / MultiUser	$550/700

SCANNERS

HP4100C 4200C / 3200C	1230/270/360
HP6200C (USB) / 6250C	$510/590
HP Doc-Feeder / Transparency for 6100C	$615/820
UMax 1220p / 1220 USB	$175/250/298
Acer clas flat scanner parallel 620P / 620S	$160/240
FlatBed color 300x600 / 600x1200 scanner	$100/120
Epson 636 / 636Pro	$750/1630
AGFA Snapscan 1212P / 1212S/1212U	$175/250/250
Canon scan 320p/620p	1150/195

CAMERA / CAPTURE

Miro XD plus Capture	$1990
Miro DC 30 Plus	1190
Kodak DC220 ZOOM / DC260 Digital	$790/1190
Zoltrix Capture card and Camera	$190
TV connection (TV Tuner)	$85
Logitec Quicam VC / Home /pro	$110/150/190
Creative WebCamII USB $179 in special	

ZIP / TAPES

HP 4G 8G Travan	$75P
Seagate TR-4 4-8G int/ext	$245/300
Seagate DAT 4-8G 4mm internal	$960/1150
SONY DAT 5000i 4mm 4G-8G drive	$950
HP DAT 4G 90mm / 4-8G 125mm	$890/1050
ViPower PCMCIA Reader int for desktop	$90
ZIP 100M int ide /parallel	$100/160
ZIP 100M scsi int/ext / USB	$155/210/210
ZIP Plus scsi int. / parallel	$240/24
Zip 250 Parallel/ USB	$270/270
JAZ 2G scsi int/ext	$450/520
Zip disk / Jaz disk 1G / Jaz 2G.	$15/110/165
JAZ traveler SCSI to Parallel adaptor	$60
ORB 2.2G int EIDE / disk	$275/70
ORB 2.2G ext. Parallel with disk	$360
ORB 2.2G disk/ SyJet 1.5 disk	$65/ 90
Travan TR1/TR3/TR4	$25/35/40
Ls120 super drive int. / disk	$170/40
DAT disk DDS-2 / DDS-3	$25/40

NETWORKS / UPS

16 bit ISA comb 10BT / 32bit PCI comb	$20/25
32 bit PCI 10/100BT Ethernet	$25
D-Link DE-530CT 10/100BT	$35
Intel PCI Pro 10/100 / Server Pro	$75/135
3COM PCI 3C900 comb 10BT	$120
3COM PCI 3C905 100BT	$75
SMC 1200BT PCI / 8416 ISA/8432 PCI	$34/80/115
BNC/Terminator/T	$3
Coaxial 10ft/20ft/50ft/100ft	$6/9/19/35
Hub 8port /16port 10BT	$70/140
Hub 100BT 8port 10/100-8port	$100/220
Hub OfficeConnect 3C16700 8P 10BT	$115
Hub OfficeConnect 3C16701 16p 10BT	$260
Hub OfficeConnect 3C16751 8P 10/100BT	$410
Hub OfficeConnect 12p 100BT	$400
Hub500 8P II 10/100BT 12p 3C16610	$880
Hub SP II 10/100 24p 3C16611	$1599
Hub 3COM 3C16440 Stack 10BT 12p.	$770
Hub 3COM 3C16441 Stack 10BT 24p.	$440
Hub 3COM 3C16405 Stack 10BT PS100 12p	$720
Hub 3COM 3C16406 Stack 10BT PSH 40 24p.	$1270
Hub 3COM 3C16450 Stack 10BT PSH 50 24p.	$1590
Hub D-Link 10BT DE805 5p / DE809 8p	$65/100
Hub D-Link 10BT DE812 12p / DE816 16p	$200/230
Hub D-Link 10BT DE824 24port.	$340
Hub Intel InBusiness SH10TE 10BT 8p	$95
Hub Intel InBusiness SH10TE0 100BT 8p w/Cnx	$425
Hub Intel InBusiness SH100T 100BT 8p	$200
Hub Intel InBusiness Pro 10/100BT 8p	$385
Router Intel Internet station SR10TP5	$580
Router Intel Internet Express 8100/9100/9200	.SWEB
Switch Hub 3COM/Intel list on WWW.ATIC.CA	
NT 5.0 Server 5 /10	$1100/1590
NT 5.0 Server25	$2390
NT 4.0 client access license/each	$45
NT Workstation 4.0 / license	$210/$60
MS BackOffice server V2.0/2.5	$2150/3100
MS SMS v1.2 10/25 users	$1420/2200
MS SNAv3.0 w/3 users	$1640
UPS300/500/650	$150/190/290
UPSSmart 450/700/1000	$390/550/690
UPSSmart1400/2200/3000	$810/1390 1990
SurgeArrest Personal 7/ w-tel.	$25/30
SurgeArrest Pro 7/ w-tel	$37 47
SurgeArrest Net 7/ w-tel	$40/55

Notebook Accessories

- **Modems and EtherNet (PCMCIA)**

56K PCMCIA fax modem v90	$100
PCMCIA 10BT Ethernet comb	$90
Xircom 100BT	$210
Xircom 100BT + 56k fax modem realport	$490
3COM 10/100BT PCMCIA (3CXFE575BT) cardbus	$220
3COM 37574 TX 10/100 LAN 16bit	$210
3COM 10BT (3CXE589DT)/10B Com (3CXE589DC)	$190/200
3COM 3CCM156B 56K global modem	$320
3COM 56K V90 Fax modem w/ Cells support (3CXM556)	$325
3COM 56K with 10/100BT LAN	$440
3COM 52900 128k ISDN PC card U int.	$530
3COM52903 128k ISDN PC card S/T int.	$475
Intel Etherexpress Pro 100BT PCMCIA 16bit	$220
Intel EtherExpress Pro Plus 10/100 PCMCIA	$370
Intel EtherExpress Pro 100 with 56k x90 modem	$490

- **Batteries, Sound Cards, Backup, SCSI**

Adaptec1450/1460/1480 SlimScsi	$140/230/200
ext parallel CD-ROM 36x / with power	$195
ext scsi 36x CD-ROM with case	$210
24x Bantam Ultra light CD ROM parallel	$350
24x Bantam CD ROM with sound Parallel	$430
32x Backpack cd-rom parallel / with sound	$300/360
NewMedia sound / game port.	$250/110
NewMedia SCSI Db25 / LAN 10BT	$125/110
Nogatech PCMCIA TV tuner	$385
Carrying case Targus Notepac CN01/20	$40/35
Universal caseCUN1 / Leather case CLN1	$80/105
Platinum Leather case CPLC1/ Traveler CL86	$210/198
Konkin case CKN2/Convertible case CCB1	$80/70
Encore Air Leather case CELIA	$200
Battery NiMH / Li-Ion for Netbook	$110/100
Battery for Toshiba/IBM Compaq Sharp/Canon	[illegible]

Notebook Memory

- **Toshiba** — 16M/32M/64M

T100 T105 T110 T115,T400 T403 T410,T415 T420 T425 T430, T433 T610 Tecra 500 series, Therm700 series and Satellite 300	$90/140/n1
Satellite 220 and Pro 440 460,470 490.	$85/130/240
Portege 300 320 330	$160/145/n1
Portege 7000CT Satellite 4000 4010 4020 and Tecra4000 series, 7020CT 3010CT	$70/130/200
Portege 650 660	$83/150/n1

- **IBM** — 16M/32M/64M

Thinkpad 760E,760ED 760EL, 760ELDSeries	$60/120/nil
Thinkpad 365X,365XD,560,560E, 380 380Z	$60/130/200
Thinkpad 760C 760CD 760L, 760LD	$75/130/nil
Thinkpad 750, 755, 480	$120/200/nil
Thinkpad 345, 360C/CE/CSE/P/PE 370, 755	$90/nil/nil
Thinkpad 770, 600, 770E, 770ED	$35/120/250
Thinkpad 350	$90/n/3/nl

- **Compaq** — 16M/32M/64M

Armada 7700Series, 7330 series, 15XX series	$60/120/200
Armada 7400, 7800	$55/110/200
Armada 4100,4110 4120,4130 4131,4220T	$70/120/220
Elite 5000 series	$75/120/220

- **Others** — 16M/32M/64M

AcerNote Extensa 366, 367 368	$60/100/200
Fujitsu Vision Book $90/150/230 Visionbook Pro	$60/100/200

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- 4.3GB UDMA66 Hard Drive
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- 64Bit AGP 8M 3D Video Accelerator Supporting Full Screen MPEG
- 15" ATX Mini-tower case 230W
- 2B Mini Mouse & Pad
- 104 Win95 Keyboard
- 40X UDMA CD-ROM Drive
- Full Duplex A3D Sound Card w/ 4 SPKs support
- 100W Multimedia Speakers
- 56K V.90 Voice/FAX Modem (Monitor Extra)
- 10/100 Mbps NetCard (@HOME /ADSL Ready)
- 2 Year Parts and Labour Warranty

HOME ENTERTAINMENT
Intel Celeron 366 MMX $1120

- 64MB PC100 SDRAM 128K 440BX, USB
- 8.4GB UltraDMA Hard Drive 33MB/s
- 3.5" 1.44MB Floppy Disk Drive
- Diamond SpeedStar 8MB 3D AGP Full Screen Mpeg support software DVD
- 15" Monitor N I L R. Digital Control 1280x1024 .28 dp PnP
- 19" Med-Tower case ATX 250W CSA
- Microsoft 3B IntelliMouse
- 104 Windows 95/98 Keyboard
- 40X UDMA CD-ROM Drive
- 64 Voices Full Duplex 3D Sound Card
- GNT-5000A Speakers w/Subwoofer & MIC
- 56K PCI Voice/FAX Modem V.90 Ready
- 2 Year Parts and Labour Warranty

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AMD K6-II 400MMXw/3D NOW! $890

- 32MB PC100 SDRAM 512k Cache, AGP USB
- 4.3GB UDMA66 Hard Drive
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- 17" Med Tower case ATX 250W CSA
- Logitech 2B PS/2 Mouse
- 104 Windows 95/98 Keyboard
- 40X UDMA CD ROM Drive
- 64 Voices Full Duplex 3D Sound Card
- 100W Multimedia Speakers
- 56K PCI Voice/FAX Modem V.90 Ready
- 2 Years Parts and Labour Warranty

EUREKA 2000
Intel Celeron 366 MMX $1810

- 64MB PC100 SDRAM 128k, 440BXPro, UDMA66, USB
- 8.4GB UDMA Hard Drive
- 3.5" 1.44MB floppy disk drive
- Diamond SpeedStar 8MB AGP Video
- 17" Monitor N I L R 1024x768, .28 dpi
- 19" ATX Tower Case 250W
- Logitech Netmouse w/Scroll & Pad
- Logitech Internet Keyboard /4X DVD-ROM Drive
- Full Duplex A3D Sound Card & 320W 3D Speakers w/Sub
- 10/100 Mbps NetCard (@Home /ADSL Ready)
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- HP 695C Printer & Acer 36bit Scanner
- Windows & Plus 98 full ver w/CD & Mannual
- 2 Years Parts and Labour Warranty

HOME & OFFICE PLUS
Intel Pentium II 350 MMX $1638

- 64MB PC100 SDRAM 512K, 440BX USB
- 8.4GB UltraDMA Hard Drive 33MB/s
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- Creative 3D Blaster SAVAGE 4 32MB AGP
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- 19" Med-Tower case ATX 250W CSA
- Logitech 2B NetMouse w/scroll
- 104 Windows 95/98 Keyboard
- 48X UDMA CD ROM Drive
- SoundBlaster PCI 128 Full Duplex 3D Wave
- GNT-5000A Speakers w/Subwoofer
- 56K PCI Voice/FAX Modem V.90 Ready
- 2 Years Parts and Labour Warranty

GAME BUSTER
Pentium II 400 MMX $2095

- 64MB PC100 SDRAM 512k, Asus 5BB-2 440BX, USB
- 8.4GB UDMA66 Hard Drive
- 3.5" 1.44MB Floppy Disk Drive
- Diamond Viper770 RivaTNT2 AGP 32MB 2D/3D
- Optiquest V95 19" Monitor .26dpi 1600x1280 TCO PnP
- 17" Med-Tower case ATX 250W CSA
- Logitech 2B NetMouse PS/2
- 104 Windows 95/98 Keyboard
- 48X UltraDMA CD ROM Drive
- Diamond MX300 A3D 2.0
- GNT-5000A Speakers w/Subwoofer
- 56K PCI Voice/FAX Modem V.90 Ready
- 2 Years Parts and Labour Warranty

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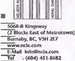

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EIDE & ULTRA DMA HD

Fujitsu	3.2GB	10ms	5400	256K	UDMA33	$165
Fujitsu	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Fujitsu	6.4GB	10ms	5400	256K	UDMA33	$175
Fujitsu	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Western Digital	4.3GB	10ms	5400	256K	UDMA66	$189
Western Digital	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Western Digital	8.4GB	10ms	5400	256K	UDMA66	$204
Western Digital	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Western Digital	18.0GB	9ms	7200	2MB	UDMA66	$439
Western Digital	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Quantum	6.4GB	9ms	5400	512K	CR UDMA66	$169
Quantum	[illegible]	[illegible]	[illegible]	[illegible]	CR UDMA66	[illegible]
Quantum	13GB	9ms	5400	512K	CR UDMA66	$269
Quantum	[illegible]	[illegible]	[illegible]	[illegible]	KA UDMA66	$279
Quantum	18.2GB	9.5ms	7200	512K	KA UDMA66	$515
IBM	[illegible]	[illegible]	[illegible]	[illegible]	UDMA33	[illegible]
IBM	16.8GB	9ms	7200	512K	UDMA33	$450
IBM	[illegible]	[illegible]	[illegible]	[illegible]	UDMA66	[illegible]
Maxtor	4.3GB	10ms	5400	256K	UDMA33	$159
Maxtor	[illegible]	[illegible]	[illegible]	[illegible]	UDMA33	[illegible]
Maxtor	8.4GB	9ms	5400	256K	UDMA33	$195
Maxtor	10.0GB	9ms	7200	512K	UDMA66	$288
Maxtor	13.6GB	9ms	5400	256K	UDMA33	$260
Maxtor	17.2GB	9ms	5400	512K	UDMA33	$340

SCSI-2 ULTRA WIDE HD

Quantum	UW	9.1GB	8ms	7200	512K	ATLAS II	$548
Quantum	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	ATLAS II	[illegible]
Seagate	USCSI	9.1GB	8ms	7200	512k	BARRACUDA	$608
Seagate	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	BARRACUDA	[illegible]
Seagate	USCSI	9.1GB	6ms	10K	1M	CHEETAH	$808

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CPU

MHZ	300	333	350	366	400	433	466	450	500	550
Celeron(A) SLOT		$108		$143	$180					
Celeron(A) PPGA	$121	$126		$109	$179	$218	[illegible]			
Pentium II MMX		[illegible]	[illegible]		[illegible]			[illegible]		
Pentium III MMX								[illegible]	[illegible]	$1179
AMD K6-2 3D		[illegible]	[illegible]		[illegible]			$179	[illegible]	
AMD K6-3 3D					[illegible]			[illegible]		

RAM

Memory Type	4MB	8MB	16MB	32MB	64MB	128MB	256MB
Regular 30pin	$25						
Regular 72pin Fast Page		$32	$50	$110	Call		
EDO 72pin	$13	$32	$58	$109	Call		
SDRAM 168pin			$39	$63	$88	[illegible]	
PC100 SDRAM 168pin				$45	$78	$140	$379
ECC PC100 SDRAM				$89	$179	$180	

MOTHER BOARD

ABIT PII/P.III 233-600MHz PC100 BH6 /BX6-2 /BM6	$149 /169 /158
ASUS PII/III 233-500MHz PC100 P2B-F /P2BDC /VM-BM	$159 /[illegible] /175
ASUS P2B-LS 440BX SCSI3 W/LAN	$534
ASUS P5A SUPER7 AT /ATX W/SOUND	$130 /158
SPECIAL INTEL MU440EX ATX W/SOUND & VIDEO	$129
ACER 440BX PII AX6BC /AX6DC PLUS W/SCSI	$158 /[illegible]
HOUSTON TECH ATX 781 AT 787	$126 /138
"NEW" M748LMR UDMA66, VIDEO, A3D, 56K, NIC MICRO ATX	$138
MICROSTAR SUPER 7 ALI ATX 512K W/USB	$130
Shuttle 591P Super7 VIA Chipset 512K AT	$109
SUPERMICRO P6SBA BX AGP 100MHZ 4PCI 3ISA	$226

Top Brand Notebooks

AT ROCK BOTTOM PRICES

Manufacturer	Model	CPU	MEM	HDD	CD	Display	Modem	Price
ACER	720TX	P 300	64MB	6.0GB	24X	14.1TFT	56K	$3350
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Compaq	1573DM	200MMX	32MB	3.2GB	24X	12.1STN		$2846
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Compaq	3660T	266MMX	32MB	4.1GB	24X	12.1TFT		$3639
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Manufacturer	Model	CPU	MEM	HDD	CD	Display	Modem	Price
Toshiba	4015CDS	PII 266	32MB	3.42GB	24X	12.1DS		$2695
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Toshiba	9980	PII300	64MB	7.63GB	DVD	14.1TFT		[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Toshiba	780DVD	PII 266	64MB	8.1GB	DVD	13.3TFT	56K	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Manufacturer	Model	CPU	MEM	HDD	CD	Display	Modem	Price
IBM	380Z	233MMX	32MB	4GB	24X	13.3T		$3930
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
IBM	390E	PII-333	64MB	6.4GB	24X	14.1TFT		$4370
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
IBM	560Z	PII-300	64MB	6.4GB		12.1TFT	56K	$4348
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
PROXCEL	M	166MMX	16MB	1GB	20X	11.3TFT		$1599
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

AOpen PII-350 TNT2000

Intel Pentium II 350 MMX $1688

- 64MB PC100 7ns SDRAM 512K, 440BX, AGP,USB
- 6.4GB UDMA66 512K Hard Drive
- 3.5" 1.44MB Floppy Disk Drive
- Diamond Viper770 RivaTNT2 AGP 32MB 2D/3D
- ViewSonic E771 .27 1280X1024 DSD PnP
- AOpen 17" Mid-Tower case ATX 250W CSA
- AOpen 2B PS/2 NetMouse
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HP	[illegible]	[illegible]	[illegible]	[illegible]
HP	Photo Smart	30	300 x 600	$539
Canon	[illegible]	[illegible]	[illegible]	[illegible]
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PRINCETON

Eurocom's desktop replacement

By Graeme Bennett

Eurocom promotes the 8500-CTS as a desktop replacement notebook, so it's probably appropriate to start by noting what kind of a desktop it aims to replace. The model reviewed sports a 433 MHz Celeron processor (a mobile Pentium II processor is available in a similarly configured model, the 8500-PTS). The unit has a truly gorgeous 15.1-inch active matrix screen, which provides 1,024x768 resolution and about the same viewable area as a typical 17-inch desktop monitor. In the notebook equivalent of a desktop unit's ATI Rage Pro-based graphics card, the 8500-CTS (and its cousin the PTS) includes 8 MB of video RAM, complete with video-capture and TV-out capabilities similar to those found in ATI's All-in-Wonder Pro.

Model 8500-CTS notebook
From: Eurocom Corp.
http://www.eurocom.ca
Price: $4,850 as tested (other models from $3,399)
Pros: Fast 433 MHz Celeron CPU, gorgeous TFT screen, full keyboard with numeric keypad. Built-in LS-120 floppy and DVD-ROM drives (no swapping necessary). Video-capture and TV-out capabilities
Cons: Low quality video capture. Unit gets quite warm—our floppy disks were hot when removed from the LS-120 drive. In our tests, the unit ran out of battery power 110 minutes into a DVD movie.

It includes two RAM slots (one of which was filled in our 128 MB-equipped test unit) plus a 6 GB hard drive, an LS-120 SuperDrive drive (which reads and writes to standard floppies and 120 MB SuperDisks) and a DVD-ROM drive—all of which were internal. The notebook has ports for USB devices, stereo audio (based on the Maestro chipset), two Cardbus slots and a pair of PS/2 ports.

The 8500-CTS doesn't include a game port, so you'd have to add one via the PC Card slot, or preferably, do away with the game port altogether and connect a joystick to the USB port. Similarly, if you prefer a mouse over the unit's built-in trackpad, you can easily add one via the USB or PS/2 ports. Our test unit didn't include a 56Kbps faxmodem, but you can plug one into the USB or PC Card ports, or pay Eurocom an extra $280 to install an internal modem.

Eurocom sells a number of upgrade options. You can add a second hard drive (in the floppy bay), a Zip drive, a port replicator, or extra Lithium Ion batteries. Although the 433 MHz Celeron CPU is currently the top of the line, other models can upgrade the CPU, RAM (to 384 MB) and hard drive. Depending on the configuration you choose, you may be able to upgrade one or all of these things. Details are available at the Eurocom Web site. You can also extend the warranty by up to 24 months at the time of original purchase for an additional $200 per year.

Screen and video capture

The 8500-CTS screen supports up to 24-bit color (with 16-bit, 8-bit and 4-bit modes also available). On this model, switching resolutions is possible and doesn't result in chunky and uneven text (which was a complaint we had with Eurocom's 1100 notebook, and many other 1998-era models). The text display scales to other resolutions using what appears to be a built-in anti-aliasing algorithm that looks great. If you want to hook up an external monitor, you can "mirror" the display, or shut off the internal LCD entirely.

The 8500-CTS's video capture capability is a unique feature for a notebook, but don't expect too much. A 640x480 capture of a clean signal from a Matrox Marvel G200-TV by the unit's RCA video-input jack was quite poor. Fortunately, captures in the highest-resolution (1,024x768) mode captures were quite acceptable for most uses.

Drives and power management

Having both DVD and floppy drives built into the drive bay is a benefit for those who've ever tried to install an operating system, such as Windows NT, or other application that requires both floppy and optical drives.

Battery life, however, was so-so. The fully charged battery ran out 110 minutes into a movie we were playing on the DVD drive—right at the climax of the movie.

The unit ships with a "hibernate mode" activated, which automatically saves all your work and system status to a file before shutting down.

We found the 6 GB drive to be noisier than those found in most other notebooks. It tended to make high-pitched beeping noises as its heads moved—sounds that were louder than any of the hard drives in nearby desktop units. You might want to check this with Eurocom if you are considering a purchase or compare the sound with that of a 3 GB drive (our review drive may have been unusually noisy).

Conclusion

As its huge screen and full-size keyboard dictate, this is one of the largest of notebooks on the market. Still, it brings an unprecedented level of portability—and expandability—to the notebook user. It is a viable replacement for a desktop PC at the home or office. ❑

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Windows 2000 beta 3

Compatibility report Part 1: Hardware issues

By Graeme Bennett

We installed Windows 2000 on several machines, including one with a minimal configuration (a 150 MHz Pentium PC with 32 MB of RAM and a 1.2 GB drive) to test Microsoft's claimed minimum hardware requirements for this operating system.

Windows 2000 Professional and Server beta

Version: testing build 2031 of beta 3 (April '99)
Summary: Plug and Play and capabilities come to Windows NT but multimedia support is lacking
Estimated price: $100

On this system, we installed an ATI All In Wonder Pro graphics card, a Sound Blaster 32 sound card and a 3Com network card. Not surprisingly, we found the company's claims that "hardware requirements have not changed since NT 4.0" to be unrealistic. The machine was very sluggish when applications were loaded onto the bare OS. Interestingly, though, the Display Properties control panel said the machine had "multiple displays." Upon closer inspection, we found that Windows 2000 had enabled "generic television" output for this ATI card's TV out jack. A browse through the drivers revealed that ATI cards are well supported—the list even included drivers for the unreleased (at press time) Rage 128 models.

Our second test machine was a Compaq Presario 1920 portable. On this system, Windows 2000 issued several warnings, citing incompatibilities with the IDE controller, APM battery manager, and even our FlashCard TrueFFS PCMCIA flash RAM card—all of which worked fine under Windows 9x. We elected not to install Windows 2000 on this unit as a result.

Our other test units didn't fare so well either. The third test system we tried was a 166 MHz Pentium PC based on an Asus P5A-B motherboard, which includes built-in CMI8330A sound hardware. Windows 2000 didn't support this, either, nor did it like the unit's Adaptec 1542CF SCSI interface, which is not exactly an obscure model and was included in Microsoft's hardware compatibility list. However, we successfully tested both Voodoo Banshee and Permedia 2 graphics cards on this machine.

We then installed Windows 2000 on a dual-processor machine based on a Legend QDI BrillianX IV motherboard. We tested this system both before and after a BIOS upgrade that added ACPI (Advanced Configurable Power Interface) compatibility, with interesting results. Before the ACPI upgrade, Windows 2000 installed without incident (except for the behaviors listed in the notes on installation). However, after a flash EEPROM update that refreshed the BIOS to a date later than 01/01/99 (an arbitrary date Microsoft uses to determine whether a machine is or isn't ACPI capable), the installer repeatedly froze moments after the Setup program started its process. We had to disable ACPI functions by modifying a text string in Windows 2000's setup information file to get the system to work.

To disable ACPI BIOS detection (which is easiest if the required directories are first copied to your hard drive):

1. Modify the file txtsetup.sif in the Windows 2000 Setup folder.
2. Change the line "ACPIEnable = 2" to "ACPIEnable = 0". Save.
3. Install Windows 2000.

Both before and after the BIOS update, several components on this system had a few difficulties with Windows 2000. Using a serial mouse caused the installer to crash during Plug and Play device detection. Substituting a PS/2 mouse solved this problem. The system included an Adaptec AIC-7880 SCSI controller, connected to a Panasonic DVD-RAM drive and a SyQuest 270 MB removable drive. All was well, although the Windows 2000 DVD player cautioned us that it required a hardware or software decoder to play back DVD movies—having the drive alone wasn't enough. A Matrox Marvel G200-TV graphics card worked as a graphics adapter only—its TV-out jack was not supported, and the video-capture software supplied by Matrox for use with NT 4.0 caused the system to crash hard when we attempted to quit the capture program.

This configuration gave us no other compatibility warnings. (Of course, that doesn't mean it was telling the truth. When we inserted a 5.2 GB data disc into the DVD-RAM drive, our attempts to read or write to it failed, resulting in an "incorrect function" error message.) This unit was also configured with a Sound Blaster Live! card, a parallel-port Travan tape backup and a parallel-connected Hewlett-Packard 7110e CD Writer. None of these units were supported and, in fact, the NT 4.0 drivers for the 7110e also caused a nasty "blue screen of death" crash. (An article at http://betanews.com details possible workarounds for the Sound ►

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Blaster Live! and the MX300, although it cautions that such fixes shouldn't be tried on multiprocessor PCs and, in fact, it didn't work for us.)

This desktop system also included a PC Card adapter with a Future Domain SCSI2Go PC Card, which apparently would have worked, but Windows 2000 complained that it was out of interrupts. A look at the Device Manager in Windows 2000 revealed another problem: both serial ports were listed as having a conflict. (The system—identically configured—worked fine under Windows 98.) IDE hard drives and CD-ROMs on all systems, however, were identified correctly. We later managed to get the PC Card adapter working by disabling one of our serial ports, freeing up an interrupt. It's worth mentioning that our tests reflect the results on this particular machine—you may, indeed, be able to use a serial mouse or two serial ports (etc.) on your system.

With a growing sense of unease, we moved on to a 450 MHz Pentium II system based on an Abit BH6 motherboard with an AMD PCNet Ethernet adapter, Adaptec 1505 SCSI card, Canopus Spectra 2500 graphics card (using the nVidia TNT chip), a Voodoo2 game card (with NT 4.0 drivers from Creative Labs' Web site) and a Terratec EWS64 XL sound card. Windows 2000 reported compatibility problems with the Terratec product, but seemed to like the other components.

Lastly, we tested a mainstream machine based on an AOpen AX59Pro motherboard (with USB and ACPI support) configured with a 266 MHz Pentium CPU, 64 MB of RAM, an Adaptec 1510A SCSI controller, Plextor SCSI CD-ROM drive, ATI Rage Pro graphics card, 3Com 10/100-BaseT network card, and a Creative Labs AWE64 sound card. Windows 2000 reported no problems, but after restarting, complained it couldn't find a CD-ROM drive and could not continue. Replacing the CD-ROM drive with an IDE model was necessary to complete the installation. On this machine, Windows 2000 complained again that the COM 1 and COM 2 ports had trouble finding needed resources. Again, we had shared an IRQ between them without difficulties under Windows 98. Apparently, Windows 2000 doesn't like this. Setting the IRQ allocations to Auto in the CMOS setup solved the problem.

The lesson we learned from our various installation attempts is that Windows 2000—even with its large library of supported devices—can be trickier than Windows 98 or 95 to configure. Using mainstream hardware and standard configurations seems to be one method of simplifying the process.

Installation

The most convenient way to install Windows 2000 is to simply boot from the CD-ROM. This requires a computer with a BIOS that supports this feature, but it makes the installation more convenient than the "three-floppy" boot process required by previous versions of NT (and OS/2). Microsoft says it is also possible to install the system over a network using a single boot floppy.

We entered our PC's CMOS setup screen (typically, you can do this by pressing DEL at startup time) and, from the Boot Order section, selected CD-ROM as the boot device. After saving these settings and restarting with the Windows 2000 disc in the drive, it booted directly into the Setup program.

From there, we were prompted to choose whether to reformat or convert our system's blank FAT formatted hard drive as NTFS or leave it as is. We elected to leave it as FAT, to maximize our options, although Microsoft maintains that new features in Windows 2000, including new partitioning tools and defrag functions, minimize the need to keep a FAT partition. Although Windows 2000 supports NTFS, FAT32 and FAT16, several other PC operating systems, including DOS and the original release of Windows 95, only support FAT16.

From there, Windows 2000 booted quickly into a graphical mode, where it installed Windows security features, device drivers and the various components needed for Workstation-mode operation. After about a half hour and three restarts, the setup program was done and the system was usable.

Windows 2000 Server beta 3 requires a minimum of 708 MB of free disk space, the Workstation version (Windows 2000 Professional) about 100 MB less, with a standard installation occupying 535 MB on a freshly formatted hard drive.

Dual boot

We also tested an installation on a machine that had Windows 95 preinstalled. Booting from the CD-ROM automatically installed Windows 2000 as a dual-boot configuration. In a separate test, we found that inserting the Windows 2000 disc in the Windows 95 environment and choosing the "install" option produced the same result. Alternately, Windows 9x users can "upgrade" their existing operating system, replacing it with Windows 2000 while retaining their existing application installation settings. In the event of a clean installation of Windows 2000, all applications must be reinstalled (theoretically at least—we found a number of apps don't need re-installation) and user settings re-entered.

In the case of an upgrade, the Windows 2000 setup program prompts you to provide software and hardware upgrade files, if any. It will also search for incompatible hardware, software and settings, and create an upgrade report that you can print or save. Users can also connect to an upgrade support page at Microsoft's Web site during this process.

In general, we recommend configuring Windows 2000 (or NT, for that matter) to dual-boot on your system to minimize compatibility headaches. As noted above, a significant number of device drivers and software applications are currently incompatible. Until you determine if any such issues exist for your system, retaining the option to select your previous operating system is the safest course of action.

It is also possible to install Windows 98 after Windows 2000 is installed, with no apparent problems. We installed Windows 98 to a different directory and, when we were done, we could select the desired operating system from a dual-boot screen at startup time. Both worked well. (This doesn't work if you convert your hard drive to NTFS during the Windows 2000 installation.)

Continued on page **58**

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Windows 98 SE includes Net sharing

By Graeme Bennett

The Internet Connection Sharing feature that allows more than one PC on a home network to share a single Internet connection is this upgrade's hottest draw

Windows 98 SE (build 4.10 2222.A)
From Microsoft
Price US$19 95 for Step Up version US$109 for full retail version (for Windows 3.x and 95 owners) A service pack for a number of minor bugs in Windows 98 will be available for free via the Windows Update feature to current Windows 98 users Some features of this upgrade (NetMeeting 3 0 Internet Explorer 5.0 and DirectX 6.1) can be downloaded for free.

While the installer runs Windows 98 SE tantalizes users with an announcement of this intriguing new capability "Link several modems together for faster Web access." At a glance, however you'd be hard-pressed to tell the difference between this edition and the previous release Consequently it's not much of an upgrade for those already using Windows 98—especially if they've already downloaded Internet Explorer 5 0.

Windows utility increases users' memory control

LONDON (NB)—If you've ever opened up several windows in your Web browser, only to see the PC crash, TFI Technology may have the answer for you in the shape of Memory+ 1 0, the first iteration of its Windows memory management software.

Phil Brown, TFI's technical manager, says the US$19 95 software allows users to control and allocate memory resources to each Windows application on the fly

"The software is the first to allow users to control how their applications are running and what memory resources are given to each specific package " he said.

A trial version which can be found on the company's Web site, will run indefinitely, but starts "nagging" the user to register the product after 30 days, according to Brown

TFI says Memory+ places a button along each title bar for control over memory usage in individual programs. The programs can then be "boosted" to ensure they get priority memory and processing time or put to "sleep" to recover resources they are currently using.

Brown says Memory+ has been designed to occupy as few system resources as possible, and sits in just 400 KB of memory

Despite this minimal footprint, the company says it is a full memory monitoring tool incorporating everything from virtual memory usage of individual programs to system page faults. An integrated cache wizard helps further tune memory performance.

Memory+ supports Windows 95, 98 and NT 4 0 ❑

TFI, http://www.tfi-technology.com/

Following are some of the upgrades to existing features of Windows 98

- **Internet Explorer 5 0 (IE5)** Microsoft's latest browser update is its fastest yet—a full 86 percent faster than Netscape Navigator 4.5 at accessing cached pages Microsoft includes the standard 40-bit encryption version of the browser with the upgrade. However Windows 98 owners can easily obtain the 128-bit encryption version via the Windows Update feature. Even without the update, the 40-bit version includes Server Gated Cryptography (SGC) technology, which allows you to conduct 128-bit transactions with international banks and financial institutions. Incidentally, you can upgrade a Windows 98 system that already has IE5 installed with no ill effects.
- **Internet Connection Sharing:** With this feature, Windows 98 can share an Internet connection Once one computer is set as the "server" and connected to the Internet any computer on an internal LAN may use that machine's connection to browse the Internet No setup is required on the client machines.
- **DirectX 6 1** Drawing heavily from ideas pioneered by Apple s QuickTime software, Microsoft s DirectX 6.1 includes a number of APIs (application programming interfaces) that allow programmers to more easily add features such as 3D spatialized sound, hardware or software-based 3D acceleration, and other services to 32-bit Windows programs Direct3D, for example allows programs such as games or 3D viewers to use a standard set of 3D function calls to ease the complex task of programming 3D graphics. DirectInput does the same thing for input devices like analogue or digital joysticks or game pads DirectShow (formerly known as ActiveMovie) and DirectSound perform similar tasks for video and audio DirectX 6.1 includes bump-mapping technology from TriTech Microelectronics and interactive music and downloadable sound sets via DirectMusic.

Bug fixes

In February, Microsoft acknowledged a bug was discovered in Windows 95 and 98 that locks up a machine after 49 7 days of consecutive use. The bug s fix (also available on the Microsoft Web site) is built into Windows 98 SE, along with fixes for a number of other issues Overall our upgraded system seems a little snappier, and so far seems to be very stable

The following features are also new in Windows 98 SE.

- **NetMeeting 3** This program is rapidly becoming the whiteboard and videoconferencing tool of choice Version 3.0 makes big changes to the interface and improves performance noticeably
- **Advanced Configuration and Power Interface (ACPI)** Support for ACPI might actually lead to some power-saving benefits now that most newer BIOSes (Jan 1 or later) have ACPI code that isn't full of bugs Of course, the probability of this depends on whether your video card, network card, etc., will "wake up" properly after ACPI-induced sleep.
- **IEEE 1394 (FireWire)** Support for 1394/USB CD-ROMs discs, and optical discs is now standard That's probably a good thing, as now Intel says it will support the technology (despite earlier flip-flops) Support for Device Bay and Windows Driver Model (WDM) modems are also provided. (Contrary to reports we've read elsewhere however we could find no evidence of built-in support for the Creative Labs' Sound Blaster Live on the Windows 98 SE disc)
- **USB** Support for USB is apparently enhanced, although we could detect no obvious changes A report at ActiveWindows.com, however, says this upgrade addresses a problem that occasionally cropped up when USB devices were plugged in
- **WebTV** The WebTV viewer is enhanced
- **Windows networking:** This now includes Virtual Private Networking (VPN) services, which allow secure network access file sharing, and more, over Internet connections
- **Updated Windows fonts.** This upgrade now supports the Euro currency symbol.

Uninstall option

As with the original Windows 98 release Microsoft provides an option to uninstall Windows 98 SE and roll back your computer to the previous operating system. This took 110 MB of disk space on our test system which was running the original release of Windows 98 before the upgrade

Also on the Windows 98 SE CD

- Microsoft's Personal Web Server which is pretty lame and doesn't even support user authentication of FTP functionality
- Both 16- and 32-bit Citrix clients for accessing Citrix s WinFrame terminal server
- A tonne of Microsoft marketing material
- Trial versions of several Microsoft games, including Golf 99, Age of Empires, Motocross Madness, Money, Monster Truck Madness and Pinball Arcade.
- In the drivers directory, you ll find a program for enabling or disabling the infamous serial number built into every Pentium III processor.
- New drivers for a wide array of new hardware, including the Voodoo Banshee, Matrox G200, and most recent Epson and Hewlett-Packard printers (unfortunately not the trouble-prone 722C)
- The old Microsoft Fax program is still lurking in a directory called "oldwin95 "
- There are a few other utilities in the Tools directory However they were included in previous Windows 98 release so we won t discuss them here
- WebTV for Windows, which unfortunately still sucks On our 266 MHz test machine, it took several seconds between mouse clicks to change channels and the process of auto-detecting channels during the initial setup is interminably slow.

Verdict

In the big scheme of things, this is a roughly equivalent upgrade to the improvements OSR2 represented to the original Windows 95 release We encountered no obvious problems or difficulties during our upgrade but no big payoff either.

We recommend Windows 98 SE for those who need Internet Connection Sharing, or want IE5 but don t want to download it Others may want to save their pennies for Windows 2000 instead ❑

Windows 2000 beta 3

Continued from page 54

One test that was spectacularly unsuccessful was our attempt to install Windows 2000 on one machine, then move the hard drive to another PC—a fairly common event here at the TCP Test Labs We pulled the hard drive from the 166 MHz Pentium system and moved it to a machine configured with the same graphics card, keyboard and mouse, and 40 MB RAM, a Sound Blaster 32 sound card, a different IDE CD-ROM drive, an Asus 440FX motherboard and a 200 MHz Pentium Pro processor—a fairly similar machine We were surprised when Windows 2000 crashed hard, refused to boot, and returned a "boot configuration has changed" error message Those familiar with Windows 95 or 98 know that these operating systems generally handle this sort of change with aplomb Unfortunately Microsoft apparently has no intention of supplying this functionality in the final release

Better DLL control

Software compatibility, in our tests, was not as much of a problem We performed in depth tests of several programs known to "mess with the system," including Internet Explorer 5.0, Microsoft Office 2000 QuickTime 4 0, and 3D Studio MAX. Windows 2000 handled them all without incident, although it warned that QuickTime "may introduce problems with the Windows 2000 control panel."

Windows 2000 Microsoft says, prevents applications from replacing core system DLL files. This should make the operating system more robust although it is expected that compatibility with some applications (for example, Novell Directory Services for NT) will be affected

Available for testing

The beta 3 version can be ordered from http://www.microsoft.com/windows/preview/order.asp A list of what is included on the beta is also available at the site

In the weeks and months ahead, we'll present some more detailed information on the beta 3 release and its successors Until then, remember that, as Microsoft Corp senior vice-president Jim Allchin recently noted, "It still has lots of bugs, and that's why it's still a beta."

As with some other Microsoft beta releases, this version is a limited technical release that expires 444 days from the date of installation ❑

HP CapShare—a scanner for your palm

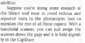
Hewlett Packard's CapShare 910 is an intriguing little gadget that actually provides page—and even paragraph—scanning on a device small enough to fit in the palm of your hand.

HP CapShare 910
From: Hewlett Packard Canada
www.canada.hp.com/cpo/home.html
List price: $1 295

But why, you may well ask, would I want to do that? Why would you need to have a battery-operated scanner that small? A reasonable question—but just think of the possibilities.

Suppose you're doing some research at the library and want to avoid tedious and repeated visits to the photocopier (not to mention the cost of all those copies). With a handheld scanner, you can just swipe the scanner down the page and it is held digitally in the CapShare.

The same goes for information you might gather at a trade show. Rather than coming home with bags full of business cards, brochures and other sundry bits of paper, you could merely take along a CapShare 910 and a handheld computer, and load them up with digital images of all those documents.



In any situation where you might have used a standard flatbed scanner for text and/or basic pictures or diagrams, the CapShare can now stand in. And you don't need a computer to use it. The CapShare can store up to 50 letter size pages of text before you have to download the data to a handheld or notebook computer.

It also includes the ability to "stitch" together parts of documents that are wider than the scanner. In our tests, this function worked surprisingly well.

Unlike earlier generations of handheld scanners, the CapShare is also fairly forgiving of hand movements. If you happen to vary a little from your scanning "path," it adjusts the scan so you can still read it. In a demonstration we saw, an HP representative "scribbled" the CapShare back and forth across a page and still obtained a readable scan.

Of course there is one thing that isn't small about the CapShare: the price. For $1 295, you will probably expect a great deal from HP's latest brainwave—and it may well deliver on those expectations. But remember that you are paying five to 10 times the price of a flatbed scanner capable of a lot more than the CapShare.

The CapShare will probably hold the most appeal for "early adopters" of handheld technology who can convince someone else to foot the bill. For the rest of us, however, the CapShare will probably have to remain the kind of James Bond-style device that we can only dream of owning, until the price drops as new versions of this technology inevitably appear.

—Geof Wheelwright

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Cool content royalty free

Music Maker Professional bundles tools with 14 discs of sound, video, graphics

By
Graeme
Bennett

One of the greatest attractions of Music Maker Professional (MMP) is surely the sheer mountain of royalty free data included with the program. It includes a massive content library consisting of 14 CD-ROMs containing thousands of professionally designed music, video and graphic samples, plus a sound database to help you find specific sounds.

Music Maker Professional
From: Magix Entertainment
Tel: 310-656-0644 http://www.magix.com
For: Windows 95/98
Price: US$599.95 (free downloadable demo available)
Pros: Includes 14 discs of royalty-free video and sound samples. Includes a powerful 64-track arranger. Exports to several popular streaming media formats. Converts MPG to AVI and MP3 to other formats. Magix says a third-party codec is required to convert to MP3.
Cons: Interface is occasionally awkward. Some file conversion attempts failed.

Key features:

- Professional 64-track project window for audio, video, graphic and midi integration
- Royalty free multimedia library with 8.4 GB of music samples, sound effects, animations, graphics and video files
- Streaming Internet formats for multimedia Web design
- Integrated multi-track hard-disc recording and WAV editing studio.
- MPEG compression
- Extensive possibilities for video processing and effects for professional video post production.
- Exact synchronization of audio and video material
- Easy and intuitive interface

There are other attractions, as well. Magix representative, Petri Nauha, who optimistically (and we think somewhat naively) characterized the package as "the first software to combine audio and video on a professional level on the PC platform," notes that MMP is one of the few programs that can turn MPG movies into AVI files. This is an odd feature for a music program to have, perhaps, but is very useful nonetheless. It can also convert MP3 files to various other formats if a suitable MP3 codec is present on the system. In a pinch, the company says, the freely downloadable WinAmp can be used for this purpose.

MMP is suitable for professional multimedia producers, Web designers, musicians, directors, graphic designers, artists and others who want to add audio to presentations, Web sites or productions. As the company promises, it lets these people be artists—not technicians.

We found the program somewhat less intuitive to use than Sonic Foundry's Acid, which has really been growing on us in recent months. As well, the graphics-heavy interface is a little sluggish at times, and there were often glitches while moving windows around, even on our Pentium II test system. The company says this issue and a few other bugs will be addressed with a free patch, which it says should be available just after press time. Acid, in contrast, worked without a hiccup under similar situations on the same systems.

However, there's no denying that the massive sound library included with MMP makes it an attractive purchase anyway. (And the MMP sound clips do work in Acid, by the way.) ❑

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K6-II (3D) 350	$249

With new system only:

Windows 98 2nd Ed. CD & Manual	$145
Work Suite 99	$135

CPU with Motherboards

Celeron 333 w/ABIT BH6 M.B.	$289
Celeron 366 / 400 w/ABIT BH6 M.B.	$269/328
Celeron 433 w/ABIT BH6 M.B.	$410
Pentium-II 350 w/ABIT BH6 M.B.	$419
Pentium-II 400 w/ABIT BH6 M.B.	$449
Pentium-II 450 w/ABIT BX6 Rev.2 M.B.	$579
Pentium-III 450 w/ASUS P2B M.B.	$599
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Pentium 233 MMX w/M.B.	$165
AMD K6-III 450 / 400(3D) w/Super7 1MB	$299/199
AMD K6-II 350(3D) w/Super7 1MB M.B.	$175
IBM MX 300 / 333	$139/145

Memory

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4 / 8 / 16 / 32M EDO 72 pin	$19/27/39/75
32 / 64 / 128M SDRAM	$45/75/159
PC100 32/64/128/256M SDRAM	$45/89/138/359

Motherboards

ASUS P2B-F / P5A-B	$189/125
ABIT BH6 / BX6-2	$145/169
Super7's Vipo/Shuttle 591P/FIC VA503+	$92/106/117

CD-ROM · CD Writer

Toshiba 40x	$73
Acer 41x	$60
Creative 48x / Panasonic 32x	$72/66
EIDE 44x	$55
Toshiba 32x SCSI / Pioneer 36x SCSI	$108/108
CD-RW 4x/2x/24x Bare / Kit Sony IDE	$345/420
Hewlett Packard 8110i CD-RW	$379
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Hard Drives/ Storage

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QT UDMA 3.2/ 4.3/ 6.4/ 8.4	$129/135/173/188
Maxtor 4.3 / 6.8/ 8.4	$139/172/189
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LS-120 Laser Floppy Drive	$115
Iomega Zip Drive (int./ext.)	$109/149

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Sound Card 16 Bit / PCI	$19/23
Sound Blaster 16 int./ AWE64 VE	$36/58
Creative Ensoniq PCI / PCI-64	$36/45
Sound Blaster PCI 128 / Live value	$57/75
Speakers 50 80W/30 105 with subwoofers	$39/62
Altec Lansing ACS43(retail) / ACS48	$69/105
PC Works 2/4-point Speaker System	$88/139

Monitors

SVGA 14" / 15" / 17"	$165/189/309
Proview 15" / 17" / 19"	$199/219/519
ADI 14" / 15" / 17" / 19"	$205/229/425/669
Samsung 15"(5E) / 17"(7E)	$239/369
MAG 17" XJ700T .25dp / XJ700E .26dp	$429/349
Panasonic S50 / S70	$258/435
Sony 100ES / 110GS	$329/319
Sony 200GS / 220GS	$560/679

This Month's Special
17" SVGA 0.26dp
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S3 Virge DX 4M PCI	$35
Cirrus Logic 1 MB Upg 2MB	$26
ATI Rage IIC 4M / 8M AGP	$49/59
ATI Xpert 98 Rage Pro/ 99 Rage 128 AGP 8MB	$48/125
ATI Xpert 128 AGP 16MB AGP TV OUT	$159
ATI Xpert @Play AGP 8M	$99
ATI Rage Magnum 32MB AGP	$225
ATI Rage Fury 32MB AGP w/TV OUT	$229
Monster Fusion 16M AGP / PCI	$165/209
Matrox Marvel G200 8M AGP TV OUT/Tuner	$369
Viper V550 AGP2X,16MB,128bit / AGP 4M	$147/89
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STB 3dfx Voodoo 2000/3000	$185/239
Video Card EDO Memory	$7
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Samsung MJ4500C Printer/Scanner/Fax/Copier	$509
BJC 1000 / 2000SE / 2000 Printer	$48*/109/169*
Epson 440 / 640 / 740 Printer	$115/265/361
Lexmark 1100 / 3200 Printer	$185/225
HP 695C / 710C / 880C Printer	$225/269/399

* comes with mail in rebate

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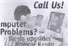

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Quantum CR 4.3GB Ultra EIDE Hard Drive
Mitsumi 104 Key keyboard PS/2
Acana 15" FS N/I LR monitor
Cirrus Logic 5465 AGP 4MB Video Card
Acer 40X EIDE CD-ROM
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Pentium II 350/400

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Asus Intel ZX chipset P2-99 Motherboard
64MB PC100 SDRAM exp to 512MB, 512 PB cache
Panasonic 1.44MB floppy drive
32 bit EIDE and floppy controller
2x16550 UART serial, 1 parallel ports & 2xUSB
ATX Mid tower 17" CSA w/250W Power Supply
Quantum CR 6.4GB Ultra EIDE Hard Drive
Fujitsu 6725 104 Key keyboard PS/2
ADI 5P+ 17" FS N/I monitor
ATI Xpert99 AGP Rage 128 w/ 8MB video card
Toshiba 40X EIDE CD-ROM
3COM USR 56Kx2 V.90 Internal F/M/V
Microsoft Intelli Mouse w/Wheel PS/2
SoundBlaster 128PCI sound card w/300W 3D speakers

$1628/1680

Celeron PGA370 366A/400A

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ATI Xpert98 AGP 8MB RAM video card
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NEC E750+ 17" Multi-Sync Monitor
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HP 170X External Print Server w/1 Par. Port.	$220
Lexmark MarkNet Pro 1 Ext Print Server.	$305
Xircom RealPort 10/100+56K Combo PCMCIA	$522
MegaHertz 10/100+56K V.90 Combo PCMCIA	$465

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APC Surge-Arrest P-Bar	$24.60
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Jewel Case for 2 CD	$1.50
SuperDuster	$9.50
DefCon Notebook Security	$65

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HP 7570e CDB 6x-Read/ 2x Write	$338
Mitsumi CRW-4802TE 2x/8x Int. CD-RW IDE	$375
Yamaha CRW4416SYC 4x/2x/16x SCSI Int/Ext	$510/620
Princo / Dysan CD-Recordable Disk	$1.95
Sony 5x IDE DVD-ROM Drive	$218
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Sound Blaster 128 PCI	$63
Sound Blaster Live Value	$78
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ADI 5P+ 17" FS N/I LR 0.26	$638
MAG DX700T 17" FS 0.25	$490
NEC A500+ 15" MULTI-SYNC 0.28	$250
NEC E750+ 17" MULTI-SYNC 0.25	$745
Optiquest Q71 17" 0.27	$389
Optiquest V95 19" 0.26	$749
Sony 200ES 17" Multiscan 0.25	$545
TVN 17" FS N/I LR 0.27 Model-A565	$340
Viewsonic E771 17" 0.27	$399
Viewsonic G780 18" 0.25	$840
Viewsonic G773 17" 0.28	$495
Viewsonic VP 140 14" LCD Panel	$1,390

Printers

Canon BJC1000 Color Bubble Jet	$155
Canon BJC5000 Color Bubble Jet	$428
Epson Stylus Color 740	$428
Epson Stylus Photo 700 720x1440dpi	$379
HP 695C Deskjet Color	$255
HP 3100 Laserjet All-in-one-centre	$1,065
HP 4000 Laserjet	$1,720
HP 2100 Laserjet	$1,078
HP 1100 Laserjet	$610
HP Photo Smart	$398
Ink-Jet Refill for Canon/Epson/HP	Call

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3COM/USR 56K X2 V.90 Int. w/Voice OEM	$190
Acer 56K V.90 Int. Fax/Voice (PCI)	$52
SupraMax 56is Int. K56 Flex PCI	$60

Flatbed Scanner

HP 6200C Flatbed Scanner	$538
HP 4100C FlatBed Scanner USB	$214
Astra 1220USR Deluxe Win/Imac 36 bit	$225
PaperPort OneTouch 7600 30bit Parallel	$219
Slimscan C6 USB 600x1200dpi 36 bit	$150

Palm Pilot

3COM Palm V Organizer	$610
3COM Palm IIIx w/4MB Organizer	$409
3COM Palm III w/2MB Organizer	$359

Video Cards

ATI Xpert126 w/16MB EDO RAM AGP	$157
ATI Rage Fury w/32MB SGRAM AGP	$249
ATI Rage Magnum w/32MB SGRAM AGP	$225
Graphics Blaster RIVA TNT w/16MB AGP	$135
Asus RIVA TNT2 32MB w/TVOUT in 3D	$385
Viper V770 NVIDIA TNT2 w/32MB 4X AGP	$259
Voodoo III 2000/3000	$194/268

Hard Drives

Quantum 4.3/6.4 GB CR UDMA IDE	$155/181
Quantum 8.4/13.0 GB CR Ultra IDE	$192/275
Quantum 6.4/9.1 GB KA 7200rpm IDE	$228/290
Quantum 13.6/18.2 GB KA 7200rpm IDE	$389/498
Western Digital Ultra IDE	call
Ultra/Ultra-2 Wide SCSI Hard Disk	call

RAM

4MB SIMM 70NS 30PIN	call
8 / 16 / 32MB EDO 60NS 72PIN	call
32 / 64 / 128MB SDRAM 168PIN	call
64 / 128 / 256 MB PC100 SDRAM 168PIN	call
Notebook Memory (Compaq/IBM/Toshiba)	call

Removable Devices

HP Travan TX-4 8.0GB Internal IDE	$365
Iomega ZIP 100MB Ext. USB Port	$229
Iomega ZIP 250MB Ext. Parallel Port	$285
Iomega JAZ Ext. SCSI 2.0GB	$495
Drive Max 7.0GB Ext. Parallel	$270

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Epson PhotoPC 750Z Digital Camera	$999
Cross Digital Pad	$359
RIO Portable Music Player PMP0 300	$290

Warranty: 2 year parts & labour on systems, 1 year on parts

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Houston Motherboard 512K Cache	BX Pro 100MHz Motherboard	Matsonic Motherboard 100MHz	Abit/Acer BX Motherboard	Asus P2B-F 100MHz Motherboard
32MB SD RAM (256MB max)	Fast 32MB SD RAM (384MB max)	32MB PC100 RAM (768MB max)	Fast 64MB PC100 SD RAM	Fast 64MB PC100 SD RAM
Fujitsu 4.3 GB Hard Drive	Fujitsu 4.3GB Ultra Hard Drive	Fujitsu 4.3GB Hard Drive	Fujitsu 6.4GB Ultra Hard Drive	Fujitsu 8.4GB Ultra Hard Drive
1.44MB Floppy Drive	1.44MB Floppy Drive	1.44MB Floppy Drive	1.44MB Floppy Drive	1.44MB Floppy Drive
64 bit Integrated Video	8MB 3D Accelerated Video	8M AGP 3D Integrated Video	SIS 8M 3D Video	Creative Riva TNT 16MB
56K FaxModem + free Internet	56K voice FaxModem + free Internet	56K voice FaxModem + free Internet	56K voice FaxModem + free Internet	Diamond 56K FaxModem w/v + free Internet
40x CD ROM Drive	40x CD ROM Drive	40x CD ROM Drive	40x CD ROM Drive	Pioneer CD 40x Speed
16 bit 3D Sound & 120W Speakers	16 bit 3D Sound & 120W Speakers	16 bit 3D Sound & 120W Speakers	16 bit 3D Sound & 120W Speakers	SoundBlaster PCI 128 & CNT 7000 Spks
15" Tower Case w/230W	Alpha 15" Tower Case 230W	15" Tower Case w/230W	Alpha 16" ATX Tower Case 250W	Alpha 16" ATX Tower Case 250W
Win95 Keyboard & Mouse	Win95 Keyboard & Mouse	Win95 Keyboard & Mouse	Win95 Keyboard & Mouse	Win95 Keyboard & Mouse
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System Options (with System purchase only)

15" monitor 0.28dp	*178*	*Mitsumi CD ReWriter 4x2x8x*	*$275*
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		Scantak Color Scanner 600x1200	*89*

System Upgrade Options:

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32M->64MB RAM PC100	*38*	*4.3->6.4GB Fujitsu hard drive*	*24*
64M->128MB RAM PC100	*75*	*6.4->8.4GB Fujitsu hard drive*	*16*
64M->256MB RAM PC100	*315*	*8.4->10GB Fujitsu hard drive*	*40*

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IBM Deskstar 10.0G 7200rpm	339
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Maxtor 10G 7200rpm	299
Quantum 4.3/6.4CR	149/175
Quantum 8.0CR/10.2Ex/13CR	199/229/279
Samsung 4.3/6.4/8.4G	139/163/179
Seagate 4.3/6.4/8.6	149/173/189
WD 4.3/6.4/8.4G	149/173/189
WD 9.1/18G 7200rpm	299/419
SCSI Quantum Atlas III 9.1G 7200rpm	589
TecRam 310 SCSI Adaptor	54

Printers

Canon BJC50/80	469/379
Canon BJC1000/2000(after 20/30 rebate)	114/129
Canon BJC4400 w/value pack	179
Canon BJC5000 11" x17"	267
Canon BJC 7000L 1200dpi	469
Canon Multifunction C3500	379
Canon Multifunction L6000 laser	759
Epson Stylus 440/640/850	185/259/485
Epson Photo700/Stylus740	359/369
Brother HL1020/1040	369/439
Brother HL1050/1060	519/599
Brother Multi P2000DX	539
Brother HL2400C full color 4M	3150
Fujitsu Laser PP10V	629
Fujitsu Laser PP16DV/16ADV	949/1369
Lexmark 1100/3200	129/229
Lexmark 5700/5770	**279/499**
Oki 8W/HP LaserJet 6L	359/509
QMS 2060BX 20ppm	2259
Printer Adaptor	25

Scanner

Dynotak 8P 300x600dpi	79
Scantak 12P 600x1200dpi	89
Canon 320P/620USB Scanner	109/169
Acer 320USB/620USB Color	129/179

CPU

Intel MMX 233/Cyrix MX300	75/55
Intel PentiumII 350/400	259/319
Intel PentiumIII 450/500	399/719
Intel Xeon 400/450	859/1299
Celeron 333A/366/400/433	119/119/159/189
AMD K6II 350/400/450	89/119/179
AMD K6III 400/450	275/348

MEMORY

72pin 16/32M EDO	42/79
SDRAM(PC100)32/64/128/256M	38/74/145/389

MOTHERBOARDS

Houston TXPro 512K sound & video	83
Matsonic BXPro video, sound AT/ATX	118/123
Abit BH6/BX6	145/185
Intel SE440BX/Acer 440BX	179/145
ASUS P2-99/P2B F/P2B-D	135/179/399
ASUS P5A Super 7 AT/ATX	123/129
MicroStar ATX/ALI 100 Super 7 AT	105/95
AcerOpen AP59/FIC 2103 Super 7	119/129

Zip/Floppy DRIVE

1.44MB Floppy Drive	$ 18
LS120 118 Drive 2x (new)	**118**
Zip Drive 100MB	99

NETWORKING

3-COM 905B PCI 10/100TX	77
3-COM 980TX 10/100TX Server	132
D-Link DE528/530TX PCI Combo	25/37
Acer Ethernet PCI/ISA Combo	17
Acer Ethernet PCI 10/100 BaseT	26
SMC PCI 9432 10/100BaseT	42
Lanc 5 Port/8 Port Hub	42/49
3-COM 16723 4Port/16722 8Port hub	148/329
D-Link 4 Port Hub 100MHz	128
Ethernet RG58/RJ45 6'/30'/50'/100'	5/12/15/29
Ethernet RJ45 1000' strand	125

CASES

15"/19" Tower Case w/230w	30/43
16"/19" ATX Tower w/250w	46/56
24" ATX Tower w/250w	85

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15" AOC/Acana/Proview 0.28	179
15" Sceptre Dragon D50/D54	209/255
15" PanasyncS50/Acer54c	259/209
15" Sony100es /Mag 700T 0.25dp	319/249
17" Acana/Futura 0.27dp	**297**
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17" Sceptre Dragon P73/D73A	309/425
17" Acer Viewgo 0.27dp	319
17" Acerview 78c 0.26/79g 0.25dp	429/559
17" PanaSync E70 .27dp/PL70 .25dp	379/569
17" Sony 210gs/Mag 700T 0.25dp	529/419
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19" Panasync SL90/Sony 400PS .25dp	777/990
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Video Camera kit USB	$99
S3 Verge PCI 4M	36
Trident 4M/SIS 4M/SIS 8M AGP	32/32/49
ATI TV Wonder	118
ATI AGP Rage II 8M	**56**
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ATI AGP All in wonder 4M/8M	169/189
ATI AGP XPERT98/Xpert 99 8M	**69/98**
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ATI AGP Magnum/Fury 32M w/TV	209/229
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Diamond Monster Fusion Banshee 16M	149
Creative Blaster Banshee 16M AGP	119
Creative RivaTNT 16M AGP	125
Intel I740 8M AGP	**52**
Asus 3800 TNT2 32M w/TV	289
Asus V3200 Banshee 16M	145
Matrox G200 8M Millennium/Mistique	149/185
Matrox Marvel 8M w/TV	369
Voodoo III 2000/3000	179/265

CD-ROM

Kenwood 52x/Asus 50x	179/89
Asus/Pioneer/Acer 40x	$72/72/59
Delta 40x	**52**
Acer 36x/Panasonic 32x	59/65
Pioneer 40x SCSI	109
TecRam 310 SCSI Adaptor	54
Mitsumi 4x2x8x ReWriter	**279**
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Panasonic DVD III 5x	129
Pioneer DVD III 6x	**149**
Creative DVD III drive	179
Creative DVD III kit w/decoder card	318

Multimedia

16 bit 3D sound card/Acer AW37	15/18
Diamond Sonic Impact/Monster MX300	37/109
Sound Blaster 16/AWE64	29/49
Sound Blaster PCI 64/PCI 128	**42/55**
Sound Blaster Live Value	76
Speakers 120w/320w/GNT5000	12/29/56
Speakers Altec Lancing ACS44	79
Microphone/Headphone w/mic	9/10
Diamond Rio 32M M3 Player	229

FAX/MODEMS

Motorola 56K V90 DataFax Voice	**27**
Acer 56K V90 Voice PCI/ISA	49/79
Diamond Supra 56K V90 Voice	59
USR 56K V90 Fax/Voice Fax	95/115
External FaxModem 56K	129

Keyboard/Mouse

Win95 / Fujitsu/USB Keyboard	12/18/35
2 button Mouse Serial/PS2/USB	6/6/15
Logitech 2 Button/scroll Mouse	9/17

Misc.

Removable Hard Drive kit IDE/SCSI	22/29
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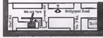

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Audio sequencers make it easy

By Graeme Bennett

So-called MOD players have existed for many years, having first appeared back in the early days of the Amiga and Atari ST (in fact, Derren Schebek wrote the first known sample player for the Atari ST in the mid '80s while working for the author of this article). The MOD files played snippets of digital audio in sequences, designed to sound like continuous waveforms—but without, of course, the enormous disk and memory requirements of waveform files.

Indeed, such software players were computer counterparts to hardware devices on the market that performed similar sample-playback tasks: the Fairlight CMI and Synclavier at the high end, and instruments like the EMU Emulator and the Ensoniq Mirage at the low end.

By the late '80s, sample players were common in the musical instrument market, as companies such as Korg, Yamaha, Roland and others quickly advanced the state of the art. Korg was a trendsetter with its M1, which added digital effects units that greatly improved the tone of the samples played. And now, all these innovations and more have now found their way into computer software sample players.

Mixman Studio Pro

From: Mixman
http://www.mixman.com
Suggested retail price: US$89

Mixman Studio Pro is a product that uses the DJ/record player metaphor for mixing audio tracks. Like Sonic Foundry's ACID (below), it can automatically match the beat, pitch and tempo of samples and loops, making it remarkably easy to develop a mix from a collection of samples.

In our tests, Studio Pro exhibited some annoyances, particularly an apparent bug which caused an occasional "glitch" sound that was not in the original source recordings. The steps involved in loading up to 16 instruments seemed clumsy. As well, we found it fairly inconvenient to alter the pitch of sections—a process that involved switching between the sequencer and track editor portions of the program.

Studio Pro allows you to "non destructively" add effects (reverb, wah-wah, and more) to your sounds. Unlike some programs, Studio Pro can apply up to 80 multi-effects presets—a feat that would be impossible on even the most powerful computers when running a real-time effects "virtual studio" environment such as Cubase VST or Cakewalk Audio.

Studio Pro comes with a limited edition of Steinberg's WaveLab for editing sounds and a great collection of samples to get you started (more free samples are provided as an incentive to register). It allows you to record your own loops, as well.

The program's easy interface makes it a lot of fun, and we really liked its export options, which include ASF (MP3), SoundFont (allowing you to create a collection of sound files that will act as MIDI instruments for Creative Labs Sound Blaster cards), WAV and the company's proprietary TRK formats. At under US$100, it's worth picking up.

ACID

From: Sonic Foundry
http://www.sonicfoundry.com
Price: US$399 full version, US$89 (trimmed-down version), or US$49 (DJ or Rock versions)

In addition to being the subject of one of the most clever and outrageous marketing campaigns in recent history, Sonic Foundry's ACID is a great program. At its introduction at Comdex Fall '98 in Las Vegas, groups of conservatively dressed "zealots" stood with megaphones outside the Sands Convention Centre and cried "Don't let your kids try ACID! ACID is dangerous!" Elsewhere, bands of tie-died "hippies" passed out pamphlets for the product, uttering slogans like "ACID is cool man. Everybody should try ACID." Throughout the city, bumper stickers and bus-banners proclaimed "Beethoven never tried ACID," and to top it off, there were a number of what may best be described as slutty-looking rock chicks with their big hair, leather pants and electric guitar cases, emblazoned with still more ACID promo stickers.

We tested the US$49 DJ and Rock genre-specific versions of the program, and were very impressed despite some limitations. The full version of ACID, unlike the "style" versions, isn't limited to eight tracks and it can add digital signal processing effects. The interface for all versions, though, is simply great—completely convenient and natural to use. (We did, however, find Mixman Studio Pro's real-time recording of volume fades, panning and patch alteration superior to ACID.)

WAV sounds can be previewed while an ACID tune is playing, and adding tracks or loops is as simple as dragging and dropping. Sections of music can be drawn in anywhere, and it is easy to change volumes, pitch or tempo. Several hundred megabytes of samples are provided with all versions of ACID. While it doesn't have as extensive an export or mixing capability as Mixman Studio Pro, its interface is a better music-making tool.

ACID is highly recommended.

Looping news

Not to be outdone, Cubase developer Steinberg has posted samples of its own looping extensions for Cubase in the ReCycle format. In addition, Steinberg and Rocket Networks announced a new set of extensions to the program that allow users to link and share projects using the Internet as a live connection.

Steinberg also announced a new version of ReCycle, the loop and groove sample editor developed in conjunction with Propellerheads Software, makers of the popular TR606/TB303 emulator, ReBirth.

The Steinberg and Propellerhead products also have the distinction of being the only ones mentioned here available on both the PC and Mac platforms. ❑

Propellerheads: http://www.propellerheads.se/
Steinberg: http://www.steinberg.de/

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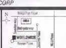

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Corel revises flagship products

Jumping out a few weeks ahead of Microsoft's June 7 launch of Office 2000, Corel Corp. unveiled the next generation of its office productivity suite, WordPerfect 2000, in mid-May The month also saw the launch of CorelDraw Graphics Suite 9

WordPerfect Suite 2000

In a briefing at *TCP*'s office Corel representatives said it has approximately 22 million WordPerfect for Windows customers in North America, and this user base will be the initial target of Corel's efforts to market the new suite The company says one of WordPerfect's strengths is its ability to handle long documents, so people who frequently work with such files will also be the focus of its marketing strategy

Corel says it is positioning WordPerfect 2000 with three messages performance, compatibility and value. Compatibility in this case refers to the ability of the suite's WordPerfect and Quattro Pro applications to open Microsoft Word and Excel files and save them in their original file format

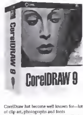
Both Corel and Microsoft have acknowledged the importance of the Internet. Microsoft has done this by making hypertext markup language (HTML) an alternative format for saving Word or Excel files Corel has taken a slightly different approach with its Web tool called Trellis WordPerfect Suite also includes an extensible markup language (XML) editor, and a portable document format (PDF) file generator. XML is seen by many as "the next HTML" because it offers more features. The PDF generator allows users to create files that can then be read on any computer with Adobe Acrobat (which is free) The beauty of PDF is that the formatting and layout of the original document are largely preserved

CorelDraw 9 Graphics Suite

CorelDraw celebrates its 10th birthday this year According to the company, there are about 5 2 million CorelDraw users in North America. While sometimes looked down upon by Mac-centric graphics design shops, CorelDraw has secured its spot in computing history by proving that world-class graphics could be created on a Windows PC

Corel is aiming the newest edition of CorelDraw at the high-end of graphic arts production Many of the revisions have focussed on enhancing CorelDraw 9's tools for a professional environment The Export-to-EPS feature has been improved, color support and management expanded and the Publish-to-PDF feature enhanced In fact, although we haven't tested it yet, it appears that the Publish-to-PDF utility offers many of the same features as the standalone product, Adobe Acrobat 4 0

Included in the suite along with CorelDraw 9 are Photo Paint 9, a few other image and font utilities and—what



CorelDraw has become well known for—lots of clip art, photographs and fonts

Both CorelDraw and Corel WordPerfect Suite 2000 now include Visual Basic for Applications We will have more detailed reviews of these products in a future issue of *TCP*.

—David Tanaka

Corel Corp., http://www.corel com

Father of Web ponders its future

TORONTO, Ont (NB)—Ten years after Tim Berners-Lee conceived the idea of the World Wide Web, it is nowhere near completed, and he hopes it never will be Delivering the first keynote address at the eighth World Wide Web Conference held in Toronto in May, to a crowd well beyond what the room could take comfortably, Berners-Lee said there is much still to be done to develop the global hypertext network.

"All that clapping and cheering we've done for ourselves is sort of like the clapping and cheering when a space shuttle blasts off for Jupiter " he said.

He outlined some far-reaching ideas about where the Web goes from here and also expressed some concerns about barriers that are delaying that progress

Berners-Lee said there is a need now for a "semantic Web" in which things can be defined in ways that will be clear to every one That will help ensure that online transactions and processes work reliably he said, by imposing some limits on what can be done in a certain context. At the same time, he added, limited languages like that which might be used to process a bank transaction must be able to link into a broader language with almost unlimited expressive power

The extensible markup language (XML) will play a major role in achieving this he said XML is expected to be a major theme at this conference

Other elements of Berners-Lee's vision include searching that is intelligent enough that a query for a yellow car for sale in Massachusetts, for example, would successfully find a primrose automobile listed for sale in Boston and the ability for two people who both have "write" access to a Web page to edit it simultaneously and see the other's changes immediately

He also said adapting social mechanisms, such as voting, to the Web is interesting. Using the Web to facilitate social processes might help raise the ethical level of society he suggested "Every few millennia we make a very small step " he said. Trying to further such steps should be in the backs of the minds of people working on the Web

These things will develop, Berners-Lee said. He did express some concern though, that today's approach to patents will stifle such development Patents are applied for and granted too readily, for "whatever your lawyer can get away with claiming," he said "I don't find that that is very conducive to working together to build the World Wide Web "

But Berners-Lee left his audience with a challenge to "continue to dream—but make sure that when you wake up from dreaming, you open a window and start coding " ❑

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Canada backs off Net regulation

British trade committee softens stand on e-commerce restrictions

By Martin Stone

OTTAWA (NB)—Both Canada and Great Britain have taken a hands-off approach to Internet regulation, at least for the time being. In May, the Canadian Radio and Telecommunications Commission (CRTC) backed off passing regulations that would impose new restrictions on Internet use and content. Days later, the British Trade and Industry Committee announced a similar conclusion in deciding not to enact the so-called "key escrow" law that would have imposed severe restrictions on electronic commerce (e-commerce).

> "Our message is clear. Let me repeat that for those of you who were worried; the CRTC will not regulate any portion of the Internet."
>
> —*Francoise Bertrand, CRTC chairperson*

Following a year of consultations and deliberations, the CRTC announced it will not institute any new laws on cyberspace and added that it's possible they never will.

Britain, however, will proceed with debate on certain new regulations, aimed primarily at e-commerce.

Among the proposed Canadian legislation was the imposition of the Broadcasting Act, which would have dictated that Canadian Web sites post a specified and significan proportion of "Canadian content."

However, CRTC spokesman Denis Carmel said the commission is satisfied with the present balance of Canadian content in cyberspace. "We feel there's enough Canadian content. We are governed by a law that says you have to encourage Canadian content. Five percent of what is on the Internet worldwide is Canadian, which is pretty big."

Great Britain based its decision on a desire to foster growth in the potentially lucrative e-commerce industry, estimated to be worth as much as US$809 billion annually by 2002.

The multi-party Trade and Industry Committee said in a report on e-commerce that a controversial proposal has been dropped from recommendations.

British members of Parliament say they hope the tempering of key escrow and other draft laws will help Britain cash in on online marketing.

Key escrow had been proposed as a way to police freewheeling electronic trade. It will not be enacted, according to insiders, when the government tables draft cyber-legislation—which is expected to happen sometime in June.

Under the key escrow plan, encryption keys used to protect electronic information would have to be registered with a third party and accessible by law enforcement agencies and other authorities armed with a warrant.

"Now that the key escrow has been dropped by the government, the rationale for an electronic commerce bill is open to question," says the report.

Britain's Industry Committee chairman and Labour MP, Martin O'Neill, said he welcomed the new approach, adding: "We need to create the climate for e-commerce to flourish. We have said there should be a more flexible way (of regulating the industry). There is now little scope for a political battle on this."

The committee report said that since measures like key escrow and liability of Internet service providers for material posted on their sites may be shelved by legislators, there remains a case for new rules to clarify certain points of e-commerce law, for example clarification of the status of "electronic signatures," on documents signed electronically using a scanner or electronic pen. The report also recommends the creation of a separate law enforcement unit to deal with computer crime.

The Canadian decision, called "stunning" by some industry observers, declares that the CRTC does not have a right or a reason to regulate the Internet and adds that the agency, which has an emphatic hands-on reputation in other broadcast matters, will never attempt to place controls on cyberspace.

CRTC chairperson Francoise Bertrand said: "Our message is clear. Let me repeat that for those of you who were worried, the CRTC will not regulate any portion of the Internet."

Carmel explains that the way the Canadian broadcast law is presently written, regulation of Internet activities falls outside their jurisdiction. "We could not even if we wanted to."

The announcement was greeted with positive response by the Canadian Internet community. Said Stephan Bartkiw, AOL

Continued on page 70

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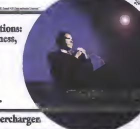

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Comparing Linux GUIs

Part 1: The GNOME desktop environment and its options

By Graeme Bennett

GNOME is probably the best-integrated desktop environment currently available for Linux PCs. Its default window manager (at least in the Red Hat Linux 6.0 distribution we examined) strongly resembles Windows 9x or NT, and the GNOME panel at the bottom of the screen acts like a cross between the sliding toolbar familiar to Apple PowerBook users and Microsoft's ubiquitous Start Menu.

It does take a little getting used to, however, so try not to get too frustrated if, like us, you find the four-screen panels of the default desktop setup confusing at first. We spent hours wondering why we seemed to unintentionally switch active screens, until we realized the mouse pointer "wraps around" as it moves from one active area to another. The multiple desktop panels look and act like the multiple desktops in Norton Desktop for Windows or the old Central Point PC Tools desktop.

Gnome applications

Other similarities to Windows are also evident. The Gnome Calendar strongly resembles the calendar app found in Microsoft Outlook, while GnomeCard provides a competent address book and Gnumeric is a decent little spreadsheet program roughly comparable to the spreadsheet functionality in Microsoft Works for Windows. GnomePad+ is a reasonably powerful hypertext markup language (HTML) editor from the Hot Dog/HomeSite/BBedit school of tag-oriented editors. There is also a time-tracker utility and gEdit, a small lightweight text editor with a spelling checker (which, we should mention, didn't insert corrected words properly into the text) and several other "plug-in" features.

Also part of the Red Hat 6.0 distribution (and indeed most others) are a number of graphics utilities including an image viewer and manipulation tool called Electric Eyes, a simpler and somewhat less awkward image viewer called GQview, and the GNU image manipulation program (GIMP). The latter title bears more than a passing resemblance to Adobe Photoshop, but with a slightly less refined interface (it has two different File menus, for example, which makes figuring out how to save a file confusing—the solution is right-clicking on your image). Overall, though, it's excellent.

Many people will be familiar with the included Web browser, Netscape Communicator 4.51, which looks and works just like the Windows versions, albeit without the wide array of plug-ins available for the Windows and Mac versions. Also provided is an IRC chat client and gFTP, an FTP client that bears a casual resemblance to our favorite Windows FTP tool, WS_FTP (which is superior).

GNOME and other graphical user interfaces (GUIs) are helping Linux overcome its early limitations in the area of multimedia—as manifested by a number of tools on the Red Hat 6.0 disc. X11amp is a WinAmp clone that, if not for its tendency to hang, could fool us into thinking it is the Justin Frankel original. It includes a mixer, CD player and a few other audio tools.

Gnome games

If you like Solitaire, FreeCell and/or other "classic" games, you're in luck. Red Hat 6.0 includes AisleRiot and a number of other amusements. If, however, you were hoping for some serious action, you'll need to look to third parties. (May we recommend starting with td software?)

Also included are a screen saver with password protection and a collection of modules, and a binary/hex/decimal/ASCII converter. ❑

Canada backs off Net regulation

Continued from page **47**

Canada president: "We are more than pleasantly surprised."

"If Canada is to compete on a global scale and continue developing a world-class presence online, we require a self-regulatory environment. We applaud the CRTC's recognition of this necessity," adds Ken Nickerson, general manager of Microsoft affiliate MSN Canada. "Microsoft feels that the Internet is too new and too global for geographically based regulations."

Information Technology Association of Canada president, Gaylen Duncan, says the judgment heralds a philosophical change. "I think this decision clearly indicates a move from being in 'protect' mode to instead being in 'promote' mode."

The CRTC promised to continue monitoring cable and telecommunications companies to ensure fair pricing and equal access but will not attempt to regulate growth or content and notes that the posting of pornography or hate material continues to be subject to the Canadian Criminal Code and that other illegal activities, such as marketing scams and copyright infringement, are policed by various other regulatory bodies. ❑

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Portable *and* affordable

TCP finds treasures in hunt for sub-$3,000 notebook PCs

By Sean Carruthers

It's a simple fact of life these days people are becoming more mobile and jobs are becoming less centralized. More and more people are working from home or on the road. When people go on holiday, they still like to remain connected. This freedom is one of the reasons why the notebook computer has remained popular, and why it continues to be one of the big prizes for computer users.

The concept of "affordable" notebook computers seems a bit of an oxymoron, and it is to some extent. It's a bit telling that when we set our parameters for this test, we set our upper limit for "affordable" notebooks at $3,000. That is, after all, about the same price that you'd pay for a top-of-the-line desktop PC. Further, the notebook generally contains slower hardware, smaller hard drives, and other compromises which make the notebook seem like less of a value than a desktop machine.

Miniaturization

What gives, you might ask. Cranking out new technologies, while not easy, is still relatively easier when there aren't size restraints. Items that are new and cutting edge in the desktop world generally take a while to shrink down to a size suitable for putting into a notebook computer.

The research involved in reducing components down to notebook size can be substantial and tends to be reflected in the costs. Like with the desktop PC world, however, what's new (and expensive) today trickles down into the area of what's affordable tomorrow. Higher-end notebooks can cost between $5,000 and $10,000, depending on how cutting-edge the components are. From that perspective, a notebook in the $2,000 to $3,000 range starts to seem like a bargain, especially when the payoff is the freedom to take the computer anywhere you go.

Diversity rules

It's worth noting that this month we saw a few changes in the notebook field. In the recent past, it seemed most notebooks were built around either a Pentium or the newer Pentium II processor. While we saw both used in this month's batch of notebooks, AMD's K6-2 chip was used in a greater number of models from a wider range of manufacturers.

The introduction of Intel's Celeron processor into the notebook world has allowed manufacturers to put even faster chips in at a lower cost. It will be a while before mobile Pentium III chips begin to appear, but the fastest of the Celeron chips provide good to excellent performance, especially when the lower cost is factored in.

Also worth noting is the move to the "three-spindle" machine, even at the lower end of the range. A three-spindle notebook is one that contains the floppy, CD-ROM and hard drives in the case at the same time. Most earlier entry-level notebooks tended to include only two, which meant the user had to choose between inserting the floppy or CD-ROM drive and had to reboot the system when they switched between the two. Although the ability to hot-swap components has gained popularity, many users prefer a machine with all of the components in the case simultaneously.

Another trend we noticed this month is that more 14-inch TFT displays are starting to drop into this "affordable" range. When we benchmarked the machines this month, we decided to set the display resolution to 800x600, which was the highest resolution common to all the machines tested. The machines that could handle the higher 1,024x768 resolution were benchmarked at that resolution, too. Oddly enough, most machines that could handle both resolutions showed little performance difference between the two resolutions.

Know your needs

Something that continues to hold true for portable computing is the need to make sure the notebook you select suits your needs—it is harder and more expensive to upgrade a notebook than a desktop PC. Notably, make absolutely sure that the screen is of adequate size and quality (especially since the boost in resolution doesn't seem to affect performance noticeably). The screen is the most difficult and expensive item to replace—if it can be upgraded at all.

It can pay off to invest a bit more up front to get a notebook that suits all of your needs, because you may be stuck with it, problems and all. It's also worth checking the pointer control device before making a purchase. The two most common types are the Touchpad and the Trackpoint, and both technologies have their fans and detractors. While it's possible to plug a mouse into most notebooks, you shouldn't have to. It's better to make sure you can comfortably use the built-in device so you don't have to dangle a mouse off the side of your portable machine everywhere you go. If you spend a bit of time making sure the machine meets all your needs, you'll be sure to come away with a better value, even if the price is a bit higher.

Testing notes

Testing this month was done with BAPCo's Sysmark 98 benchmarking software. All machines were tested using their AC power adapters. The display resolution was set to 800x600 in 16-bit color depth for all notebooks. We also tested in 1024x768 resolution (also 16-bit color depth) if the machines would support it.

Benchmarking scores generated with Sysmark 98 should not be compared with scores generated with the older Sysmark 32 (which we used in *TCP* Lab Tests prior to January 1999), as they are calculated using different base platforms that are not directly comparable.

A special note about all of the specs listed below and in the chart: these represent the specs of the exact models tested for this roundup. Most of the manufacturers offer multiple variations of each of these models, allowing different sized hard drives, more RAM, extra components (a modem, or a DVD instead of a CD-ROM drive, for example), or different operating systems. Readers are encouraged to check the manufacturers' Web sites to find out what options are available and what configurations would be most suitable for them. Keep in mind, though, that each of these variations will affect the pricing.

All systems tested in this roundup included a standard floppy drive, CD-ROM drive, two PC Card slots and at least one USB port. Variations are noted where they occur.

Pricing for each of the models was obtained from the manufacturers or their representatives. Because of the fast pace of the market and the volatility of the Canadian dollar compared to the U.S. dollar, pricing may be subject to some fluctuation.

Continued on page 74

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All systems come with 1 year parts and 3 years labor warranty plus 1 month free Internet

Portable and affordable
Continued from page ***72***

Acer TravelMate 330T

Estimated street price: $2 999
http://www.acer.com

Software

- Operating system: Windows 98

Components

- Processor: 300 MHz Pentium II.
- RAM: 32 MB
- Hard drive: 4.8 GB
- The floppy and 24x CD-ROM drives come in one external housing, which is connected via a cable. This makes the case far more compact.
- Internal 56Kbps modem
- One PC Card slot.
- One CompactFlash card slot.

Multimedia

- At 12.1 inches, the TFT screen isn't overly large but it is good quality.
- The sound is a bit thin, but users can attach external components for better sound.

Size and usability

- At 2.54 cm (1 in.) thick, this is one of the smallest units available, and is also one of the lightest, weighing only 1.85 kg (4.1 lb.) with the battery in.
- Because the CD-ROM and floppy drives are external, users who need to use either on a regular basis may find the arrangement inconvenient and awkward. This configuration is better-suited for people who don't use removable media on a regular basis.

The TravelMate is aimed at users in search of ultraportability. Unfortunately, this slim design comes at the expense of usability. Users who need to access data on floppies or CD-ROMs on a regular basis may want to take a pass on this machine, but those who use them only occasionally may love the unit's incredibly small size. With the 56Kbps modem built into the case, it becomes even more attractive for those who like to travel light.

Angel 8200 PowerNote

Estimated street price: $2 950
http://www.angelcomputer.com

Software

- Operating system: Windows 98

Components

- Processor: 400 MHz Celeron with 128KB cache
- RAM: 128 MB
- Hard drive: 4.3 GB.

Multimedia

- The 14.1 inch TFT display is quite good.
- Includes a 4 MB ATI Rage Pro graphics chip.
- Sound is good, and users can attach headphones or microphone.
- In addition to the standard VGA, there is also an S-VHS output.

Size and usability

- At 31.75 cm (12.5 in.), the 8200 is a bit wider than a number of other notebooks, but this width accommodates a fuller, more usable keyboard. The 8200 is also thinner than most notebooks.
- The case can simultaneously contain the floppy drive, CD-ROM drive and battery, which eliminates component swapping.

Set up as an entry-level notebook, the 8200 PowerNote nonetheless has plenty of power and goodies. It has a large screen, two USB ports (double the usual number) and one of the faster CPUs in this report. The one thing that is really missing on this model is a modem, which the users can add in for a bit extra. Otherwise, this is a nice little package.

Angel 8400 PowerNote

Estimated street price: $2,999
http://www.angelcomputer.com

Software

- Operating system: Windows 98

Components

- Processor: 300 MHz Pentium II CPU with 256KB cache

- RAM: 128 MB
- Hard drive: 4.3 GB.

Multimedia

- The 13.3-inch TFT screen is a bit smaller than the 8200's, but is large enough to achieve a 1,024x768 resolution with great quality.
- The graphic subsystem is based on ATI's 8 MB Rage Pro.
- Sound is good. Users can attach headphones or a microphone.
- In addition to the standard VGA, the 8400 comes with S-VHS output.

Size and usability

- At 31.2 cm (12.3 in.) this case is one of the widest in this review, but it accommodates a more full-sized keyboard.
- At 5.6 cm (2.2 in.), the notebook is also one of the thickest machines this report.
- The case simultaneously contains the floppy drive, CD-ROM drive and battery, which eliminates component swapping.

Created with business users in mind, the 8400 has a Pentium II processor, better graphics (though with a slightly smaller screen), and the same multimedia and USB

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- Standard 2B Mouse
- 17" ATX Tower Case with 250W

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S3 4MB AGP/PCI	$35/40
Diamond Viper V770 TNT2 16MB	$157
ATI Xpert98 8MB	$70

All prices are 3.5% cash discounted. Subject to change without notice.

functionality as the 8200 The CPU only comes with a 256KB cache While this is a step up from the Celeron model it would still compromise the performance compared to a similarly configured model with a full 512KB cache Despite this, the performance is quite good, and overall, the 8400 PowerNote delivers a lot of value.

Software

- Operating system Windows 98
- McAfee Virus Scan AudioRack and LapLink.

Components

- Processor 300 MHz Celeron with 128KB cache Although not as fast as a Pentium II with the same speed the cost saving is notable.
- RAM: 32 MB
- Hard drive: 3 2 GB While a a bit small, it helps to keep the overall pricing down.
- Built-in 56Kbps modem

Multimedia

- Video is courtesy of a 2 MB Trident 9388 PCI
- The 12 1 inch TFT screen is a bit small, but otherwise provides crisp reproduction. The size also helps keep the price down
- Sound is good and users can attach external audio components for better sound

Size and usability

- The E342 has two bays one for a CD-ROM drive and the other one for a battery or floppy drive Although all three can't be installed at the same time, the bays can be hot-swapped using a software control program. There is also a "blank" bay cover that can be used instead of the battery/floppy bay, to make the machine lighter
- Instead of the Touchpad or Trackpoint, Fujitsu uses its own ErgoTrac pointer control mechanism on this system This is a nice alternative for users who dislike the Touchpad although it may be a bit on the sensitive side for detail work.

Continued on page 80

Eurocom 1200-T3

Suggested retail price: $3,000
http://www.eurocom.ca

Software

- Operating system. Windows 98

Components

- Processor 400 MHz AMD K6-2
- RAM 64 MB
- Hard drive 4 GB.
- It has a Touchpad pointer control, though users can attach an external mouse.

Multimedia

- Video is a 4MB S3D Virge MX+ PCI
- The 13.3-inch TFT has a resolution of 1,024x768 Display quality is very good, although it is on the dim side even when cranked to maximum brightness.
- Sound is reasonably good. Users can attach a microphone or headphones for better audio.

Size and usability

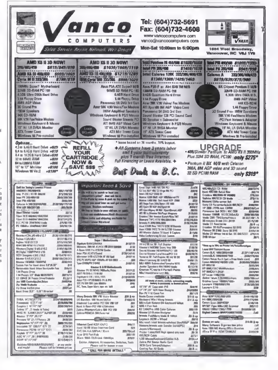
- At 4.5 cm (1.75 in) thick and 2.87 kg (6 6 lb.) the 1200-T3 is perfectly manageable for day-to-day use.
- The case contains the floppy drive CD-ROM drive and battery simultaneously which eliminates component swapping

Canada's own Eurocom has earned a reputation for building good notebooks, and this one shows why. Everything is included inside the case the hard drive and video are both reasonably good, and it has a fast CPU, all without going over the target price Users can change any of the items in their preconfigured package to suit their own needs (changing the price, of course), but this one is well featured as it is.

Note Eurocom's 2100 line currently retails at around $5 000 but a new Celeron version is expected to be available for under $3,000 by time of publication. We didn't have a chance to test this model for this review, but wanted to make a note of it.

Fujitsu Lifebook E342

Suggested retail price. $2,530
http://www.fujitsu.ca



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SOHO Network Solution

8 Workstation Solution
System Configuration

Server
Intel Pentium-II 400MHz w/512K L2 Cache
ASIT Main Board
128M PC100 SDRAM
ATI PD Charger 4M AGP
40X CD ROM
1.44 Floppy Disk Drive
8.4GB Hard Drive
USB PPC and Bottom w/all
D-Link DFE 530 Network Card
17" SVGA Monitor

$216/pm
$5999

Workstation
Intel Celeron 366MHz w/128K L2 Cache
Asus Main Board
64M PC100 SDRAM
8M [illegible] AGP
40X CD ROM
1.44 Floppy Disk Drive
4.3GB Hard Drive
D-Link DFE 530 Network Card
15" SVGA Monitor

Network HUB
8 Port Network Hub
8 Set 25' Pool Network Cable

Warranty
1 Year Parts & Labour
First Time On-Site Set UP & Delivery

Operating System Preinstalled:
98 Windows 98 Windows NT Workstation 4.0

Home Office

2 Workstation Solution
System Configuration

Intel Celeron 366MHz w/128K L2 Cache
Asus Main Board
64M PC100 SDRAM
4M [illegible] AGP
40X CD ROM
4.3GB Hard Drive
1.44 Floppy Disk Drive
32 Bit PCI Sound
15" SVGA Monitor
Windows 98 Preinstalled
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Option 2 Action Links Phone Line Network

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Internet Access Sharing
Printer & Scanner Sharing
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3COM 3C900B-TX	$108
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INTEL PILA8470	$152
INTEL PILA8472	$300
DLINK DFE530TX	$38
DLINK DE 530CT+	$58
ACER ALN 201	$25
SMC9432TX	$88

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INTEL SS101TX8US	$478
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3COM 3C16733	$500
3COM 3C16981	$1133
3COM 3C16950	$1988
3COM 3C16981	$2250
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SMC 6508TT	$1380

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NP XI CEM56 100BTX	$433
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NP XI CB 56	$105
NP-XI RE 100BTX	$221
NP-XI-BBE-100BTX	$211
NP-XI-C03B 100BTX	$218
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INTEL PCLA4481	$328
HP J2550B ABA	$475
HP J2591A ABA	$384
HP J3258A	$215
HP J3264A	$808
HP J3112A	$879
DLINK DP100	$378
DLINK DP300	$483

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HP Laserjet 4050N	$2118
HP Laserjet 4000T	$1809
HP Laserjet 5000	$2158
HP Laserjet 5000N	$3048
HP Laserjet 5000GN	$3864
HP Laserjet 8100DN	$5110
Lexmark Optra K 1220N	$1788
Lexmark Optra S 1625N	$1840

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ACP BK200	$124
ACP BK300	$138
APC PRO 280	$105
APC PRO 420	$318
APC SU420	$343
APC SU620	$422
APC SU700	$482

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3COM 3C16700 8PORT	$118
3COM 3C16731 8PORT	$108
3COM 3C16792 16 PORT	$258
3COM 3C16704 4PORT	$70
3COM 3C16870A 12PORT	$708
3COM 3C16871A 24PORT	$1338
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INTEL SH10T8US 8PORT 10BT	$81
INTEL SH10T8BUS 8PORT 10BT	$110
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SH101TX8US 8PORT 10/100BT	$285
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SOHO 8PORT 10BT	$49

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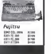
UNIX 5.05 ADDITIONAL 10 USER	$660

Notebook



TOSHIBA

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TP570 P 300	[illegible]
TP390E Celeron 300	[illegible]
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TP1200E PII 333	[illegible]
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TP570 PII 300	$4095
TP570 PII 333	$4795
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TP 600E PII 366	$5250
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SAT P100XCDT	$5600
SAT P100PCDT	$4200
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TEC 8000 PII P366	$6720

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Armada 1500C CEL 266	$2010
Armada 1700 L300	$3620
Armada 4150 P I 300	$3700
Armada 4000 P300	[illegible]
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ARMADA 1100, 7800 1600 100 000 640/1000 — $85 95/198/299
ARMADA PPPST 10M/000 110 — CALL

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SATELLITE PT1CDS P50CDS CD1 PROTEGE TEC 1110 PPB AnB 128B — $93/190/299
SATELLITE PPDCDSII P TPTCOT/ D & P50CDS P 1 4PB 128 64B — $65/119/199
TECRA 7000/8010 1 18M/PPB/64B — $65/199/199

Memory IBM

THINKPAD P40XD 380P 390 100/P20/64B — $64/P13/188
THINKPAD 380XD PII P60P 12B/32B/64B THINKPAD PII 600 7700 17000 600/610/120B — $68/P13/299
[illegible] — $84/126/299
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K6II-400 + MB + 8M Video + 3D Sound	$239
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Prices and availability subject to change without notice. We reserve the right to correct typographical errors

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Super Buy

GNT5000A SubWooferSpeakers	$55
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K6II-300 ... $539
Intel 233mmx ... $529
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40X CDROM / 1.44M FDD
Win98 KeyBoard / Mouse
3D Sound / 140w Speakers
56K V90 Voice/Fax Modem

Super7 Master

AMD
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-450 ... $769
K6III-400 ... $869
ASUS Super7 Motherboard
64M 100mhz SDRAM
Intel 740 8MB AGP Video Card
4.3G UDMA HDD / 1.44M FDD
40X Ultra DMA CDROM
Logitech Mouse / Keyboard
3D Sound / 140w Speakers
56K V90 Voice/Fax Modem

PII Partner

Intel
Celeron 366 $777
-400/-433 ... $799/ $859
PII-400 ... $929
ABIT PII Motherboard
64M 100mhz SDRAM
ATI 8MB AGP Video Card
4.3G UDMA HDD / 1.44M FDD
40X Ultra DMA CDROM
Logitech Mouse / Keyboard
3D Sound Card / 140w Speakers
56K V90 Voice/Fax Modem

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-400 ... $1029
P3-450/-500 ... $1149 /$1449
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64MB PC100 SDRAM
ATI 8MB AGP Video Card
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40X Ultra DMA CDROM
3D Sound Card / 140w Speakers
Logitech Mouse / PS2 Keyboard
56K V90 Voice/Fax Modem

Dream Machine

P3-450 $1999 $59/month
P3-500 ... $2299
Asus P2BF Motherboard
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Diamond V770 TNT2 32MB AGPx4
10G 7200rpm HDD / LS120 Drive
Panasonic DVD3 installed
Sound Blaster Live value
Altec 45.1 Subwoofer Speakers
MS Internet mouse / Natural KB
USR 56K V90 Voice/Fax Modem

Configurations are customized. Leasing & Financing are available. Home Business dealers are also welcome.

Price for reference only. Please check our website for updated price !

CPU

Intel P-166 / 200mmx / 233mmx	575 / 79 / 79
Intel Celeron 300A + BH6 @450 gurantee	call
Intel Celeron 366 + BX6 @550 gurantee	call
Intel Celeron 366 / 400	119 / 139
Intel Celeron 433 / 466	189 / 289
Intel PII-333 / 350 / 400	209 / 259 / 279
Intel PIII-450 / 500 / 550	399 / 589 / 1119
AMD K6II-300 / 350	85 / 88
AMD K6II-400 / 450	119 / 169
AMD K6III-400 / 450	259 / 329
Cyrix M2 300 / 333 / 366	59 / 65 / 89

MEMORY

Memory	8M	16M	32M	64M	128M	256M
168pin SDRAM		100Mhz	42	79	149	349
72pin EDO	25	45	79			
72pin REG	30	49	86			

MOTHERBOARD

Pentium 512K (AT) + 4M Video + 3D Sound	89
Super 7 (AT) AGP + 3D Sound	99
Super 7 (AT) + 8M AGP + 3D Sound	119
ASUS P5AB (AT) Super 7 AGP	125
ASUS P5ABa(AT) Super 7 AGP+3D Sound	135
ASUS P5A (ATX) Super 7 AGP	135
ASUS P5Aa(ATX) Super 7 AGP+3D Sound	145
Pentium II	
BX (AT) + 8M AGP + 3D Sound	129
BX (AT) + 8M AGP + 3D Sound + Modem	159
ASUS (ATX) P2BF / P2BS	179 / 449
ASUS (ATX) P2BD Dual CPU	379
ASUS (ATX) P2-99 / (AT) P2-99B	139 / 139
ASUS S370 Intel 810Chipset	269
Acer AX6BC (ATX)	149
ABIT (ATX) BH6 / BX6 V2	139 / 165
ABIT (ATX 370) BM6 / ZM6	155 / 149

HDD / LS120 / ZIP

HDD	4.3	6.4	8.4	10	13	18GB
Fujitsu	149	169	189	229	299	
WD	159	169	189	239	269	429
Quantum	159	179	199	229	279	

WD SCSI UW 9G / 18G 7200rpm	575 / 995
Maxtor 7200rpm IDE 10G / 20G	295 / 469
LS120 2x 120mb Super Drive / Diskette	119 / 14
Zip 100MB Int IDE Drive / Diskette	109 / 14

VIDEO

G400 Millenium AGPx2 32M / 16M	239 / 179
Asus V3800 TNT2 Video IN/OUT 3DGL	299
Diamond V770 TNT2 Ultra 32M AGPx4	345
S3 3D Virge DX 4M PCI	32
Intel740 AGPx2 3D 8M	52
3Dfx VooDoo2 PCI 12M + Game Pack	139
3Dfx VooDoo3 16M 2000 / 3000	179 / 245
ATI 3D Xpression PCI 4M	49
ATI Xpert 98 AGP / PCI 8M	69 / 79
ATI Xpert 128 AGPx2 16M	129
ATI Xpert Play98 8M AGP/PCI PC2TV	89 / 99
ATI All-in-Wonder Pro 128M AGP PCI	319
ATI Rage Fury AGPx2 32M PC2TV	229
Creative Riva TNT / Banshee 16M AGPx2	125
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Matrox Marvel-TV AGP/PCI 8M	389
ATI TV-Wonder / TV Tuner	119 / 119
Logitech Quickcam home USB V-Camera	119

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MP3 Player Diamond RIO PMP300 Ret	279
16bit 3D Sound Card ISA	17
Sound Blaster 16 PnP / AWE 64 ISA	33 / 53
Sound Blaster PCI 64 / 128 / 512	45 / 59 / 79
Sound Blaster *Live* value PCI 256	75
Diamond Monster 3D MX300 PCI	109
GNT5000A Subwoofer & Speakers	55
YAMAHA M5W10 Subwoofer & Speakers	129
Cambridge 4 point Subwoofer & Speakers	129
Altec Lancing 45.1 Subwoofer&Speakers	108
Microphone / Headset Mic +Vol Control	8 / 12

CD-ROM / CD-WRITER / DVD

40X Liteon / Acer	59 / 62
Creative 48X	79
Sony 32X / ASUS 50X	79 / 99
Toshiba 40X IDE / SCSI	78 / 169
Panasonic 7502B CD Writer IDE	315
Panasonic 7502B CD Writer SCSI	329
Mitsumi 8x4x2 CD Re-Writer IDE	299
Yamaha 16x4x4 CD Re-Writer IDE	439
Yamaha 16x4x4 CD Re-Writer SCSI	419
Yamaha CDRW4416 External SCSI	595
SONY CD Re-Writer 24X4x2 IDE	359
SONY CD Re-Writer 24X4x2 SCSI	399
HP 8110i CD Re-Writer 24x4x2 IDE	389
HP 8200i CD Re-Writer 24x4x4 IDE	425
5x DVD3 Sony 5x32x	169
5x DVD3 Toshiba / Panasonic	139
6x DVD3 Pioneer Slot Load / Tray Load	179
Blank CD Recordable / Re-Writable	1.6 / 8

MODEM / NETWORK

Rockwell 56K V.90 Modem PCI / ISA	39 / 75
56K V.90 V/F/D Net-Win-Modem ISA	69
Aopen 56K V.90 V/F/D Modem PCI	49
USR 56K V.90 Modem PCI / ISA	79 / 115
PCMCIA 56K Modem	105
Acer Ethernet Card PnP PCI / ISA	21 / 19
Acer 100/10mbps PCI Ethernet Card	28
D-Link 100/10mbps Ethernet Card	32
3COM 3C905BTX 100/10mbps PCI	79
PCMCIA Network Card	99
Diamond Homefree Combo ISA to PCMCIA	329
Diamond Homefree Desktop ISA to PCI	289
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15" / 17" / 19" NI LR Monitor	199 / 319 / 539
17"	
AcerView .27 72e / .28 78c / .28 79g	329/ 439/ 509
ADI .28 5P+ / .26 5GT	419 / 529
ViewSonic .27 E771 / .26 G773	389 / 489
.26 P775 / .25 PT771	569 / 635
Optiquest .27 Q71 / .26 V73	359 / 459
Sony .25 210GS / .25 220GS	559 / 679
Hansol .26 V701P / .26 V701A	389 / 339
Proview .26 PS775	339
19"	
Acerview .26 99C / Hansol .26 900P	739 / 809
ViewSonic .26 G790 / Optiquest .26 V95	759 / 689
Sony .25 420GS / ADI .26 6P	949 / 659
LCD 15" ADI 279mm 6L / 6T	1359 / 1579

PRINTER

Canon 1000 / 2000 Color Inkjet	149 / 179
Epson Stylus 440 / 640 / 740	195 / 269 / 375
Epson Stylus Photo 750 6 Colors 1440dpi	449
HP Inkjet Color 695c / 710c	235 / 265
Lexmark 3200 / 5700 Color Inkjet	235 / 299
HP Laser 1100 600dpi 8ppm	599
Brother Laser HL-1020 / 1040	369 / 449
Brother Laser HL-1050USB	539
Okidata 600dpi Laser 8ppm	399

SCANNER

Umax 1220S / 1220U USB	209 / 229
Mustek 1200LS / 600 USB	149 / 129
Acer Scan 620S SCSI / 620P	169 / 155
Acer Scan 620U USB	169
Acer Scan 620ST SCSI Transparency	209
Acer Scan 620PT Transparency	239

Keyboard & Mouse

Wireless Keyboard / USB Keyboard	99 / 39
Windows 95 / 98 Keyboard	13
Chinese Keyboard	19
Chinese Natural Keyboard	39
Chinese Hand-Writing Pen	79
Multimedia Function Keyboard	39
Fujitsu 8725	25
MS Natural Keyboard (with system only)	49
USB Mouse 3B	16
2B Serial / PS2 Mouse	8 / 8
MS Intellimouse (with system only)	35
Logitech Wheel Mouse	19
PS2 ↔ AT Keyboard Adapter	5
Keyboard Drawer	16

Cable

Printer Cable (Bi-Directional) 6' / 15'	7 / 15
IDE Cable / FDD Cable	3
Power Split / Power Bar	5 / 6
SCSI Cable with 3/ 5/ 7 Connector	6 / 8 / 12
Extention Cable for Monitor / KeyBoard	9
5xBNC RGB VGA Cable	29
External Modem Cable (Serial Port Cable)	7

Others

486 / Pentium AMD CPU fan	9 / 9
PII CPU fan / Celeron CPU fan	16 / 15
2" Case Cooler 3pin / 4pin	15 / 12
Dual fan Heatsink for PII / Celeron	35
Heatsink Compound / Thermal Paste	10
HDD Cooler / PCI Ventilator	17 / 35
Mobile Rack w/fan for HDD/ZIP/LS120etc.	20
Mounted Frame for FDD / HDD	9 / 9
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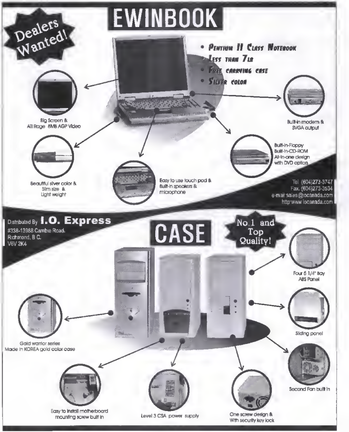
Switch Box for Monitor 2 / 4 port	15 / 19
Switch Box for System 2 / 4 way	28 / 39
Printer Card / Enhanced	19 / 24
Monitor Screen Filter 15" / 17"	25 / 39
SCSI / Ultra SCSI Card PCI	69 / 159
SCSI Adapter DB25F/MiniDin 50M	19
Power Supply AT 230w / 250w	25 / 30
Power Supply ATX 250w / 300w	39 / 59
Anti-Static Wrist Strap	9
APC UPS BF280	129
APC UPS BK500M 500VA 250w	199
USB HUB 4 Port	69
PS2 Port / USB Port / USB Card	3 / 16 / 55

SOFTWARE call

Anti Virus Norton 5.0 / McAfee 4	29
MS Windows98 Upgrade Version	109
MS Windows98-Chinese Ver (w/ sys only)	169
Lotus Smart Suite 98 Millenium	49



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Portable and affordable

Continued from page 75

A relatively recent entry into the Canadian notebook market, the Fujitsu's Lifebook series has expanded to cover a variety of needs. This model is poised as an entry-level notebook, and is a great choice for the user who is more interested in portability than power. The machine works rather well, and includes a 56Kbps internal modem. Fujitsu manages to keep the price affordable by using a smaller screen, smaller hard drive and a Celeron processor. The two PC card slots have locking clips to prevent cards from falling out—a nice feature.

Note. Another member of Fujitsu's notebook line, the Lifebook 360, was listed at $3,300 at the time of the review, but will be subject to a price cut in the near future. As it is a more full-featured model, readers may want to keep an eye on this one, too.

Hewlett-Packard Omnibook XE2

Suggested retail price: $2,680
http://www.hp.com/omnibook

Software
- Operating system: Windows 98.
- McAfee Virus Scan.

Components
- Processor: 300 MHz Celeron with 128KB cache.
- RAM: 32 MB.
- Hard drive: 3.82 GB. It isn't exceedingly large but it helps to keep the price down.
- Built-in 56Kbps modem.

Multimedia
- The unit we tested came with a 12.1-inch LCD screen with a passive display. This lower-quality of screen may put a number of users off, especially with active TFT screens so familiar now. The notebook does have an option for TFT, but at an extra cost.
- Sound is good, and users can plug in an external microphone or headphones for better quality.
- The case features external audio controls for the CD-ROM drive, which can be used as a CD player even when the notebook is turned off. Controls are recessed well, and are hard to accidentally hit during normal use.

Size and usability
- The system case fits the CD-ROM drive, floppy drive and battery simultaneously, which eliminates component swapping.
- The keyboard on this notebook was particularly nice to use.

At the entry level in Hewlett-Packard's Omnibook line we have this model, which is aimed squarely at the casual or new notebook user. Its low price and CD player functionality are attractive features for someone who wants a bit more fun out of their notebook. Some users will probably want to upgrade from the passive display to a TFT screen, which is a bit easier on the eyes. The lower overall price with the passive screen, however, makes this model a good starting point.

Hyperdata 150

Estimated street price: $1,599
http://www.hypernotebook.com

Software
- Operating system: Windows 98.

Components
- Processor: 333 MHz AMD K6-2.
- RAM: 32 MB.
- Hard drive: 3.1 GB. This is relatively small.

Multimedia
- The 12.1-inch passive display is not suited to much more than casual use. As with all passive displays, pointer movement can cause the pointer to disappear entirely while in motion.
- The sound is good, and users can attach headphones or a microphone for better quality.

Size and usability
- At just over 3.6 kg (8 lb.), this notebook is an

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56X V.90 voice Fax/Modem
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the heavy side and is not as suitable for carrying as some other models in this report.
- The CD-ROM drive, floppy drive and battery fit into the case simultaneously which eliminates component swapping

If pricing is the most important factor, then this model may be worth a look. It manages to pop a 333 MHz CPU under the hood, and has pretty much all of the goodies you need for notebook use (PC card slots battery, and even a carrying case). In getting the price down to under $1,600, however, some major sacrifices had to be made The hard drive is one of the smallest available, there's not much RAM no modem The screen is pretty hard to look at for extended periods, and the whole unit is on the heavy side

Users looking for a notebook that will be a constant traveling companion will probably want to spend the extra dollars and upgrade the screen, at the very least. The good news is that this price point puts the power of a full-featured notebook into the same range as some of the higher-end hand held units Users thinking of a CE device may be tempted to step up to this type of machine instead

Hyperdata 6020

Estimated street price. $2,999
http://www.hypernotebook.com

Software
- Operating system. Windows 98

Components
- Processor 300 MHz Mobile Pentium II.
- RAM 64 MB
- Hard drive: 4 4 GB. This is a good size.
- The CD-ROM drive can be upgraded to DVD drive for an extra cost.

Multimedia
- The 6020 features a crisp 14 2 inch TFT screen, with an 8 MB ATI graphics chip lurking beneath for excellent display quality
- The sound is good and users can attach headphones or a microphone for even better quality
- In addition to the VGA, there is also an S VHS port.

Size and usability
- Although lighter than the 150 model above, the 6020 is still about 3 3 kg (7 5 lb) which may be on the heavy side for some users. For the most part, it's a manageable weight though
- The case manages to fit in the CD-ROM drive floppy drive and battery simultaneously which eliminates component swapping

At $2,999, this system sits at the upper limit of this month's "affordable" price range, but manages to throw in a lot of the quality seen in higher-end systems The screen is nice and large everything is included in the case, it comes with its own carrying case and the construction is sleek and sturdy Users with a few extra dollars will probably want to have a modem installed and may be interested in upgrading to a DVD drive Even without those things the 6020 is a great little notebook that should please even demanding users.

IBM ThinkPad 390

Suggested list price: $2,899
http://www.can.ibm.com

Software
- Operating system. Windows 98.
- Norton AntiVirus, Ring Central, system and productivity tools

Components
- Processor 233 MHz Pentium II
- RAM 32 MB
- Hard drive 3.2 GB This is on the small side.

Multimedia
- The 12 1 inch screen is on the small side but the TFT display is good quality
- The audio is good and users can attach external headphones and a microphone

Size and usability
- The battery floppy and CD-ROM drives are all included in the case simultaneously which eliminates component swapping
- The Trackpoint is very responsive and precise, making it one of the best—if not the best—pointer control devices going
- There are no Windows keys on the ThinkPad's keyboard which can make life a bit difficult for those who are accustomed to using them for manual menu selection

IBM's ThinkPad series has long been a favorite of customers and reviewers alike. Although the overall system performance may be lower than that of other machines, there are a number of other things that compensate for it. The keyboard is one of the nicest in the notebook world, and the Trackpoint pointer control is one of the easiest to use. There are external controls for screen brightness and volume, and everything seems to fit together well, making it a machine that's a pleasure to use, even when it isn't tearing up the competition performance-wise

MTI Smartbook 3100C

Estimated street price. $2,995
http://www.mobiltech.net

Software
- Operating system Windows 98.
- ATI DVD player software

Components
- Processor 400 MHz Celeron with 128KB cache
- RAM 64 MB.
- Hard drive 4 GB
- DVD drive

Multimedia
- The 14 1-inch screen is a good size and offers clear display reproduction. It's powered by a 4 MB ATI Rage LT Pro chip
- Sound is quite good. Users can attach headphones or a microphone for better quality.
- DVD video playback is smooth
- In addition to standard VGA, the notebook has S-VHS output

Size and usability
- At more than 3 15 kg (7 lb) the 3100C is on the heavy side but is still manageable for most users
- The case fits the floppy drive DVD drive and battery simultaneously eliminating component swapping.

MTI is offering some new models in its Smartbook line, and the 3100C is the more powerful of the two we looked at this month Although the processor is a Celeron and not a Pentium II it still provides ripping performance with some of the highest benchmarking results this month With the DVD drive onboard and two USB ports, this is a great little machine

MTI Smartbook 5100C

Estimated street price $2,095
http://www.mobiltech.net

Software
- Operating system: Windows 98.

Components
- Processor 333 MHz Celeron with 128KB cache.
- RAM 32 MB.
- Hard drive 4 GB

Multimedia
- The 12.1-inch screen is a bit small but the quality is good The display is running on an S3 Virge MX graphics chip
- Sound is good Users can attach headphones or a microphone
- In addition to the standard VGA, the notebook also has S-VHS output

Size and usability
- The 5100C is a thicker but lighter than its sibling, the 3100C
- The case fits the floppy drive CD-ROM drive and battery simultaneously which eliminates component swapping

Although the screen is on the small side, the 5100C is a good overall choice for those who don't need a larger screen It has a good selection of components and though it's not as speedy as the 3100C, the performance is still quite good In all, it provides a good value for those who want to save a bit of money

NEC VersaNote 270

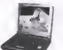
Suggested retail price $2 837
http://www.nec-computers.com

Software
- Operating system. Windows 98 (Windows 98 available).

Components
- Processor 300 MHz Celeron with 128KB cache
- RAM. 64 MB.
- Hard drive: 4 GB.
- Internal 56Kbps modem

Multimedia
- The 12 1 inch TFT screen is small, but the quality is good
- Sound is good, and users can attach external headphones or a microphone for better quality

Size and usability
- The VersaNote is similar in size to many other notebooks in this report but it is a bit lighter which many users may find to be a big plus. Note: The model we tested was 2 89 kg (6.4 lb) although the spec sheet lists it at 2 75 (6.1).
- The case fits the floppy drive, CD-ROM drive and battery simultaneously which eliminates component swapping.



The VersaNote 270 is one of the more budget-oriented models in NEC's notebook line Performance is reasonable, and it fits all the components (including a modem!) inside the case With a 12 1 inch screen (and its 800x600 maximum resolution), it may fall short of the needs of more demanding users, but others might find that it's just the thing they need.

Toshiba Satellite 2540XCDT

Estimated street price. $2 996
http://www.toshiba.ca

Software
- Operating system. Windows 98.

Components
- Processor 333 MHz AMD K6-2
- RAM 64 MB
- Hard drive 4 GB.
- Internal 56 Kbps modem.

Multimedia
- The 14 1 inch screen is nice and big The NeoMagic display adapter provides the graphics
- Audio is good. Users can attach headphones or a microphone too

Size and usability
- Users who aren't fans of the Touchpad may be more impressed by the AccuPoint pointer control on the Satellite line However the AccuPoint has a tendency to be a bit too sensitive at times, causing users to overshoot the mark.
- The left and right-click buttons are located one on top of another instead of in a left right orientation, which will take some getting used to.
- The machine has one Windows key tucked along the top row Some users may find this a bit awkward

Continued on page 84

	Acer TravelMate 330T	Angel 8200 PowerNote	Angel 8400 PowerNote	Eurocom 1200-T3	Fujitsu Lifebook E342	Hewlett-Packard Omnibook XE2	Hyperdata 150	Hyperdata 6020	IBM ThinkPad 390
Screen size (in.)	12.1	14.1	13.3	13.3	12.1	12.1	12.1	14.2	12.1
Screen technology	TFT	TFT	TFT	TFT	TFT	passive	passive	TFT	TFT
Screen res. (pixels)	800x600	1,024x768	1,024x768	1,024x768	800x600	800x600	800x600	1,024x768	800x600
Processor	P II 300 MHz	Celeron 400 MHz	P II 300 MHz	AMD K6-2 400 MHz	Celeron 300 MHz	Celeron 300 MHz	AMD K6-2 333 MHz	P II 300 MHz	P II 233 MHz
Cache	256KB	128KB	256KB	512KB	128KB	128KB	512KB	256KB	512KB
RAM	32 MB	128 MB	128 MB	64 MB	32 MB	32 MB	32 MB	64 MB	32 MB
BIOS	Acer	SystemSoft MobilePRO	SystemSoft MobilePRO	SystemSoft MobilePRO	Phoenix	Phoenix	Award	SystemSoft MobilePRO	IBM
Operating system	Windows 98	Windows 98	Windows 98	Windows 98	Windows 98	Windows 98	Windows 98	Windows 98	Windows 98
Pointer control	Touchpad	Touchpad	Touchpad	Touchpad	Ergotrac	Touchpad	Touchpad	Touchpad	Trackpoint
Hard drive	4.8 GB	4.3 GB	4.3 GB	4 GB	3.2 GB	3.82 GB	3.1 GB	4.4 GB	3.2 GB
Floppy drive	external	standard	standard	removable	hot-swappable	standard	standard	standard	standard
Optical drive	24x external	24x CD-ROM	24x CD-ROM	24x CD-ROM	24x CD-ROM hotswap	24x CD-ROM	24x CD-ROM	24x CD-ROM	24x CD-ROM
Battery type	Lithium Ion	NiMH	Lithium Ion	Lithium Ion	Lithium Ion	NiMH	NiMH	Lithium Ion	NiMH
Video	Trident Cyber9525 2.5 MB AGP	ATI Rage LT Pro 4 MB AGP	ATI Rage LT Pro 8 MB AGP	S3 Virge MX+ 4 MB PCI	Trident 9388 2 MB PCI	Silicon Motion Lynx	NeoMagic Magic Graph	ATI Rage LT Pro 8 MB AGP	NeoMagic 2.5 MB PCI
Audio	ESS Solo	ESS Solo	ESS Maestro	ES1869	ES1879	ESS Maestro	ES1869	Crystal SoundFusion	NeoMagic MagicMedia
Modem	56Kbps	none	none	none	56Kbps	56Kbps	none	none	56Kbps
VGA out	yes	yes	yes	yes	yes	yes	yes	yes	yes
USB ports	1	2	2	1	1	1	1	1	1
Infrared port	yes	yes	yes	yes	yes	yes	yes	yes	yes
Mouse/keyboard port	shared	shared	shared	shared	shared	shared	shared	shared	mouse
PC Card slots	1	2	2	2	2	2	2	2	2
Windows keys	1	1	1	1	2	1	2	1	0
Accessories	none	none	none	carrying case	none	CD audio controls	carrying case	S-VHS carrying case	none
Dim. WxDxH cm	29x21.8x2.5	31.8x25.7x3.6	31.2x30.5x5.6	29.5x24.4x4.4	31.2x24.9x5.1	31.1x24.9x4.2	29.8x24.1x5.1	30.5x26x4.4	31.5x25.4x5.1
(in.)	(11.4x8.6x1)	(12.5x10.1x1.4)	(12.3x12x2.2)	(11.6x9.6x1.75)	(12.28x9.8x1.99)	(12.25x9.8x1.65)	(11.75x9.5x2)	(12x10.25x1.75)	(12.4x10x2)
Weight kg (lb.)	1.8 (4.1)	2.97 (6.6)	3.5 (7.8)	2.97 (6.6)	3.1 (6.84)	2.97 (6.6)	3.7 (8.25)	3.38 (7.5)	3.38 (7.5)
Benchmarking results (800x600 / 1,024x768)									
Office productivity	112 / NA	150 / 198	131 / 151	103 / 103	90 / NA	91 / 98	52 / NA	105 / 121	83 / NA
Content creation	123 / NA	155 / 155	132 / 131	101 / 101	114 / NA	113 / 114	98 / NA	125 / 124	98 / NA
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	MTI Smartbook 3100C	MTI Smartbook 5100C	NEC Versalite 270	Toshiba Satellite 2540XCDT	Trogon Qualitas 24	Twinhead Power Slim	Twinhead Slimnote GX	Ultinet Powernote 3100C	Ultinet Powernote 5100C
Screen size (in.)	14.1	12.1	12.1	14.1	14.1	12.1	14.1	14.1	12.1
Screen technology	TFT	TFT	TFT	TFT	TFT	TFT	TFT	TFT	TFT
Screen res. (pixels)	1,024x768	800x600	800x600	1,024x768	1,024x768	800x600	1,024x768	1,024x768	800x600
Processor	Celeron 400 MHz	Celeron 333 MHz	Celeron 300 MHz	AMD K6-2 333 MHz	P II 300 MHz	P 300 MHz	P II 300 MHz	Celeron 466 MHz	Celeron 466 MHz
Cache	128KB	128KB	128KB	512KB	512KB	512KB	256KB	128KB	128KB
RAM	64 MB	32 MB	64 MB	64 MB	64 MB	32 MB	64 MB	128 MB	128 MB
BIOS	SystemSoft MobilePRO	SystemSoft MobilePRO	Phoenix	Toshiba	Phoenix	AMI	AMI	SystemSoft MobilePRO	SystemSoft MobilePRO
Operating system	Windows 98	Windows 98	Windows 98	Windows 98	Windows 98	Windows 98	Windows 98	Windows 98	Windows 98
Pointer control	Touchpad	Touchpad	Touchpad	AccuPoint	Touchpad	Touchpad	Touchpad	Touchpad	Touchpad
Hard drive	4 GB	4 GB	4 GB	4 GB	4 GB	4.3 GB	4.1 GB	4.3 GB	4.3 GB
Floppy drive	standard	standard	standard	standard	standard	external	standard	standard	standard
Optical drive	DVD	CD-ROM	24x CD-ROM	24x CD-ROM	24x CD-ROM	24x CD-ROM (ext.)	24x CD ROM	24x CD-ROM	24x CD-ROM
Battery type	Lithium Ion	Lithium Ion	Lithium Ion	Lithium Ion	Lithium Ion	Lithium Ion	Lithium Ion	Lithium Ion	Lithium Ion
Video	ATI Rage LT Pro 4 MB AGP	S3 Virge MX 4 MB	NeoMagic MagicGraph	S3 Virge MX 2 MB PCI	Trident 9397 4 MB PCI	Trident 9385 2 MB	ATI Rage LT Pro 4 MB AGP	ATI Rage LT Pro 4 MB AGP	S3 Virge MX+ 4 MB AGP
Audio	ESS Maestro	ESS Solo-1	ESS Maestro	Yamaha	ESS Maestro	ESS Maestro	ESS Maestro	ESS1978	ESS1978
Modem	none	none	56Kbps	56Kbps	none	56Kbps	none	56Kbps	56Kbps
VGA out	yes	yes	yes	yes	yes	yes	yes	yes	yes
USB ports	2	1	1	1	2	1	1	2	1
Infrared port	yes	yes	yes	yes	yes	yes	yes	yes	yes
Mouse/keyboard port	shared	shared	shared	shared	shared	shared	shared	shared	shared
PC Card slots	2	2	2	2	2	2	2	2	2
Windows keys	1	1	1	1	2	2	1	1	1
Accessories	S-VHS, carrying case	S-VHS, carrying case	no	no	joystick port, S-VHS, carrying case	no	no	S-VHS, carrying case	S-VHS, carrying case
Dim. WxDxH cm	31.5x25.4x4.1	27.9x23.5x5.1	30.2x24.8x3.8	31x25.9x4.1	32x25.1x4.8	26.7x22.2x3	31.1x25.4x4.4	31.5x25.7x3.9	27.9x23.9x3.8
(in.)	(12.4x10x1.6)	(11x9.25x2)	(11.9x9.7x1.5)	(12.2x10.2x1.6)	(12.6x9.9x1.9)	(10.5x8.75x1.2)	(12.25x10x1.75)	(12.4x10.1x1.5)	(11x9.4x1.5)
Weight kg (lb.)	3.47 (7.7)	2.97 (6.5)	2.48 (5.4)	3.24 (7.2)	3.24 (7.2)	1.9 (4.2)	3.06 (6.8)	2.97 (6.6)	2.57 (5.7)
Benchmarking results (800x600 / 1,024x768)									
Office productivity	139 / 137	113 / NA	96 / NA	92 / 90	110 / 106	75 / NA	121 / 121	166 / 162	152 / 150
Content creation	151 / 150	125 / NA	118 / NA	98 / 96	118 / 118	82 / NA	128 / 127	171 / 171	165 / 163
Sysmark 98	144 / 142	118 / NA	130 / NA	66 / 63	114 / 112	78 / NA	124 / 124	166 / 166	157 / 156
Contact	800-530-8212	800-530-8212	888-863-2988	800-387-5645	888-487-6466	800-552-8946	800-552-8946	800-513-7732	800-513-7732
Web site	www.mobiltech.net	www.mobiltech.net	www.nec-computers.com	www.toshiba.ca	www.trogoncomputers.com	www.twinhead.com	www.twinhead.com	www.ultinet.ca	www.ultinet.ca
Warranty	3 years	3 years	3 years	1 year	1 year	1 year	1 year	1 parts, 3 labor	1 parts, 3 labor
Price	$2,995 street	$2,098 street	$2,837 SRP	$2,689 street*	$2,995 SRP	$2,495 street est	$2,875 street (est.)	$2,595 street	$2,585 street

*price doesn't include AC adapter

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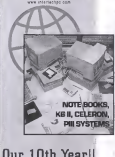

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HP710C Color Inkjet Printer	$289
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Intel Pentium II/Celeron Pro Power Systems.

Components:
- Windows 98 with Manual
- Maxtor 10G Diamond Max 7200rpm
- 128meg SDRAM 100Mhz Compatible
- 17" Tower case 250watt ATX format
- Logitech Naimouse NMB keyboard
- Internal 56K Voice/Fax/modem
- ATI Xpert 128 Pro 128 16 MG RAM
- ASUS P2-99 Motherboard ZX Chipset
- 44X CD-ROM 1.44mg Floppy Drive
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- Creative DVDx5 $100
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Celeron	433	MMX	$1679
Celeron	466	MMX	$1759
Pentium II	350	MMX	$1729
Pentium II	400	MMX	$1789
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Pentium III	500	MMX	$2229
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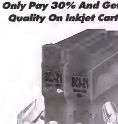

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Portable and affordable

Continued from page **81**

The Satellite 2540XCDT is one of the entry level models in Toshiba's Satellite line. The model we tested brings a lot of the higher-end technology down to a more affordable level, including the larger TFT screen and the AccuPoint pointer control. The biggest issue with this notebook is usability: Toshiba's control layout (notably the orientation of the left and right-click buttons and the placement of the Windows key) is different than other notebooks, and many users may find it initially disorienting or just plain awkward (although Toshiba has been the top notebook maker in Canada for years). For those who have no problem working with those kinds of differences, the Toshiba notebook makes a good traveling companion.

Trogon Qualitas 24

Suggested retail price: $2 999
http://www.trogoncomputer.com
(The Trogon line is distributed in Canada by Montreal-based GAON Technologies.)

Software

- Operating system: Windows 98

Components

- Processor: 300MHz Pentium II
- RAM: 64 MB.
- Hard drive: 4 GB

Multimedia

- The 14.1-inch screen offers plenty of space although the display surface has fairly noticeable pixels, lending a slightly rough quality to the display.
- The sound is quite good. Users can attach microphone or headphones.
- In addition to the standard VGA, there are also S-VHS and RCA video-out jacks on the back of the machine.

Size and usability

- The case is a bit wider than most of the models tested this month. While it may be a bit unwieldy for some, the weight is still reasonable and it allows a fuller keyboard, making the machine easy to use.
- The case fits the floppy drive, CD-ROM drive and battery simultaneously, which eliminates component swapping.

The Qualitas 24 is one of the notebooks available under the Trogon name. This model has a large screen, good multimedia capability (with extra video-out ports) and twice the number of USB ports of most of the notebooks tested this month. The keyboard is top-notch. Although those who plan to use their notebook intensively may find the screen a bit hard on the eyes, it should be fine for more casual users.

Twinhead PowerSlim

Suggested retail price: $2 495
(price converted from US$ and subject to fluctuation)
http://www.twinhead.com
(The Twinhead line is distributed in Canada by Montreal-based GAON Technologies.)

Software

- Operating system: Windows 98.

Components

- Processor: 300 MHz Pentium
- RAM: 32 MB.
- Hard drive: 4.3 GB
- Floppy and CD-ROM drives are external.
- Internal 56Kbps modem

Multimedia

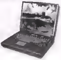
- At maximum resolution, the 12.1-inch TFT screen may not be adequate for a number of users, but the quality is quite good.
- The sound is a bit thin. The line out and microphone jack supplement the internal speakers.

Size and usability

- At just over 2.5 cm (1 in.) thick and 1.9 kg (4 lb.), the PowerSlim is the most portable machine in the round-up—by far.
- To achieve the thin size, the floppy and CD-ROM drives have to be attached externally. The floppy is hot swappable, but the CD-ROM is not. Users who require access to either drive on a regular basis may find this configuration time-consuming and awkward.
- The keyboard is very condensed, and some of the keys are on the small side.

Although all of the notebooks we looked at this month are designed to be mobile, the PowerSlim is the most portable, with a thin design and the lightest weight of all the units tested. Because of this, the screen is smaller (only 12.1 inches) and the floppy and CD-ROM drives are external. Granted, it's not ideal, but for users who don't need either while travelling, it may be the best overall solution. Even better, the internal modem makes it possible to keep in touch while on the road. Demanding users may want to take a pass (the notebook turned in the slowest benchmarking scores this month), but for those whose needs are minimal, this system is compact and ready to go.

Twinhead SlimNote GX



Suggested retail price: $2,975
(price converted from US$, subject to fluctuation)
http://www.twinhead.com
(The Twinhead line is distributed in Canada by Montreal-based GAON Technologies.)

Software

- Operating system: Windows 98

Components

- Processor: 300 MHz Pentium II with 256KB Level 2 cache
- RAM: 64 MB
- Hard drive: 4.1 GB.

Multimedia

- The 14.1 inch TFT screen is nice and big, and offers crisp and clear graphic reproduction. It uses a 4 MB ATI Rage LT Pro AGP graphics chip.
- The sound is good. Users can attach headphones and a microphone.

Size and usability

- The SlimNote GX is definitely larger than the PowerSlim but is still a reasonable size compared to most other notebooks. Its slightly wider 30.8 cm (12 in.) case accommodates a full-sized and very usable keyboard.
- The case also fits in the floppy drive, CD-ROM drive and battery simultaneously which eliminates component swapping.

Where the PowerSlim is a very minimal machine, the SlimNote series is more substantial, incorporating all three spindles and a larger screen inside the case. This notebook uses a Pentium II chip, but only has a 256KB Level-2 cache, which may turn off more demanding users. Still, performance is good and the only other thing this machine really lacks is a modem. Even so, the SlimNote GX is a good little unit.

Ultinet Powernote 3100C

Price: $2,895
http://www.ultinet.ca

Software

- Operating system: Windows 98
- Choice of Corel WordPerfect Suite 8 or Microsoft Essentials

Components

- Processor: 466 MHz Celeron with 128KB cache.
- RAM: 128 MB.
- Hard drive: 4.3 GB.
- Note: Ultinet also offers this system with DVD drive for the same price, but at the expense of 64 MB of RAM, the software bundle and the modem. However the DVD option does include ATI's software DVD player and Xing MPEG software. A third option is to keep the original configuration and and the DVD drive for only $235 extra.

Multimedia

- The 14.1-inch TFT screen is nice and big, and offers a crisp display. An ATI Rage LT Pro chip supplies the graphics.
- Sound is good. Users can attach headphones or microphone for better quality audio.

Size and usability

- This case is a bit wide at 31.5 cm (12.4 in.), but it's also thin at 3.8 cm (1.5 in.). For the size of the case, the 2.97 kg (6.6 lb.) weight is also quite good.
- The floppy drive, CD-ROM drive and battery fit in the case simultaneously, which eliminates component swapping.

The FYO (Price Your Own) system on Ultinet's Web site allows users to change virtually any part of their notebook to suit their needs. As a starting point, however, the version tested this month includes a lot of components. The CPU is one of the fastest around, there's plenty of RAM, and the screen is large and high quality. With a modem included and two USB ports, even the base model is very impressive.

Ultinet Powernote 5100C

Estimated street price: $2,595
http://www.ultinet.ca

Software

- Operating system: Windows 98.
- Choice of Corel WordPerfect Suite 8 or Microsoft Essentials.

Components

- Processor: 466 MHz Celeron with 128KB of cache.
- RAM: 128 MB.
- Hard drive: 4.3 GB.
- 56Kbps modem.
- Note: Ultinet offers this system with a DVD drive for the same price, at the expense of 64 MB of RAM, the software bundle and the modem. When the DVD option is selected, ATI's DVD player and Xing MPEG software are included. A third option is to keep the original configuration and add the DVD drive for only $235 extra.

Multimedia

- At 12.1 inches, the TFT screen is on the small side, but the quality of the display is good. It uses the S3 Virge MX chip for graphics.
- The sound is good. Users can attach headphones or a microphone.

Size and usability

- The smaller size of the 5100C makes it more portable than some of the other notebooks this month.
- The case squeezes in the floppy drive, CD-ROM drive and battery simultaneously, which eliminates component swapping.

For a those on a tighter budget, Ultinet also offers the 5100C model. Specs-wise, it's very similar to the 3100C (same CPU, hard drive, and RAM), but the big sacrifice is screen size and video. For users who don't need the larger screen, this one offers great performance, at a lower price.

Editor's Choices

MTI Smartbook 3100C

It's on the expensive end of the units in this roundup, but this notebook has a lot going for it, from its extra multimedia functionality (a DVD drive and video out) to the fast performance turned in by its 400 MHz Celeron processor.

Ultinet Powernote 3100C

Ultinet's 3100C is also a winner, with an even faster CPU boosting its performance, lots of RAM and the option of including a DVD drive. Ultinet allows all of its systems to be customized, but with great choices like this, you may not have to. ❑

Digital TV expected to spur sales of PCs more than TVs

MENLO PARK, Calif. (NB)—The growing presence of digital television will heartily boost the sale of video-enabled computers, while causing the market for TV sets to erode slightly, according to a new report on digital TV trends.

As standard digital television (SDTV) becomes increasingly available between 2002 and 2004, more viewers will swap their 27-inch to 32-inch TV sets for more moderately priced widescreen SDTV sets, while smaller sets will be replaced by video PCs and Internet appliances, predicts the report from McLaughlin Consulting Group, a marketing and technology services firm made up of electronic-display professionals.

The forecast doesn't bode well for the super-sharp high definition television programming known as HDTV, as more people are expected to choose PC monitors that offer HDTV programming as well as Internet video content over big screen HDTVs. "We found that HDTV alone will not dramatically shift the price point for TVs to a much higher price," said Chuck McLaughlin, co-author of the report.

"People are backing away from HDTV (as a stand-alone entity) as the business model moves toward multicasting," McLaughlin said.

One of the biggest drawbacks cited about digital television has been the price. HDTV sets currently on the market average US$7,000 or higher. A survey by the Yankee Group found that viewers will pay no more than US$474 for digital TV.

"The hard reality of consumer behavior is people don't spend a lot of time or money shopping for a TV with a big picture," McLaughlin said.

The report is based on interviews with about 150 players in the retail, telecommunications, entertainment, computer and consumer product industries, as well as secondary research.

The consulting firm also reduced its estimates for the penetration of HDTV for 2006, the year targeted by the Federal Communications Commission for all TV stations to offer digital transmissions, from 40 percent, to a "more realistic" 27 percent. The conclusion is in line with overall industry expectations that the transition to digital, which debuted last October in limited markets, will be tougher than was originally imagined. ❑

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No sugar coating on Mauve

By Jean Allen-Ikeson

With the recent tragic incidents of violence by teens against teens in both Colorado and Alberta, CD-ROM projects such as Mauve should pique some interest. Mauve, which targets troubled adolescents, was produced with the financial assistance of Health Canada the International Development Research Centre and Heritage Canada. It includes a Resource Kit for Teen Guidance a Teen Support Guidebook and access to an Internet discussion group

Mauve
From Médiaspaul/Pentafolia Multimédia
Tel 514-322-7341 http://pentafolie com/mauve
For Windows 95/98, Power Mac
Available in French at English
Price $140

Besides hormonal changes, one of the most significant developments in the teen years is a shift from seeking advice coping skills and values from adults to seeking it from peers Teens begin forming strong cliques to cope with the world When those peers are angry depressed, immature, or manipulative, and the world is viewed as distressing, there can be tragic consequences.

Getting through to a chronically depressed teen is exactly what Mauve was designed to do It includes video of teens talking about school, friends love depression, spirituality and suicide For those who feel isolated, just knowing that others have had the same thoughts and have found positive solutions can be a start

Mauve is not an educational program for parents who want their kids to improve their math scores It is intended as a tool for mental health workers to open a line of communication to troubled teens. Through the hundreds of testimonials, video clips, cartoons photos sound effects and music, Mauve provides teens with a look at what their peers think and feel, and it allows them to stand back and begin assessing their own situation.

I showed this disc to a child psychiatrist and a counselor who works with street kids and troubled youth. Because the language and topics are raw, direct and lack any "niceties," the psychiatrist worried that it might further alienate already dysfunctional adolescents. But the youth worker thought Mauve was terrific. He said it would be great for some teens to hear stories from a peer group. He suspected that it would build self awareness, improve insight and let kids see that others face the same issues and problems.

Mauve can also be an important tool for training professionals. It offers them a first-hand view of how troubled teens talk about and view their friends and environment

Apparently, many chronically depressed kids do not have this awareness, and Mauve seems to be a safe way to gain this insight, and open up discussion Because it is so frank and open this youth worker saw it as a preventative tool, not something that would be suitable for suicidal clients

Mauve can also be an important tool for training professionals It offers them a first-hand view of how troubled teens talk about and view their friends and environment It's not only useful as an introduction to youth culture, but also as a source of information on what solutions other youths have found

Mauve is an attempt to help those who need—but seldom seek—help And for them it should come as a breath of fresh air. ❑

IBM Gekkoto powers new Nintendo console

Nintendo's next game console will be powered by a PowerPC-derived CPU manufactured by IBM. The Gekko processor, will operate at 400 MHz and will be made with IBM's 0 18 micron copper process.

The chip will find a home in Nintendo's Dolphin console, which the company plans to launch in time for the 2000 Christmas season. The companies say the multi-year agreement will be worth more than $1 billion

Nintendo of Canada says the video game business in this country has grown by 55 percent in the last two years and it is predicting that its business will grow by 20 percent in 1999

Among the 15 new titles the company has announced this year for the Nintendo 64 console are Star Wars Episode I Racer, based on a race scene in *The Phantom Menace* movie, and a 64-bit version of Donkey Kong.

Nintendo of Canada, based in Richmond, B.C. is a wholly-owned subsidiary of Nintendo Co of Kyoto, Japan.

Console competition

The new console is Nintendo's answer to the new Dreamcast from Sega, launched late last year, and the planned PlayStation 2 from Sony Corp With Dreamcast already on the market and Sony promising its machine by spring 2000 sales of existing machines such as the Nintendo 64 and PlayStation, are beginning to fall

To remain a serious player in the market Nintendo needs a new machine and, with the recent announcement, has indicated it intends to follow a path similar to that of Sega and Sony

More than just a games console, the PlayStation 2 is expected to be able to play DVD videos and discs and access the Internet becoming an all-in-one companion for a television set. Prompted by the competition, Sega has recently begun announcing plans for a removable drive attachment for the Dreamcast and this month launched an online shopping mall accessible from the console.

With the announcement that it will include DVD technology from Matsushita, Nintendo also said it is teaming with the consumer electronics giant to develop "convergence products that incorporate next generation game machine and digital audio-video technologies."

—David Tanaka and Newsbytes

Nintendo, http://www nintendo com

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Lexmark, HP launch $150 photo inkjets

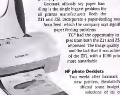
Within a couple of weeks in May, both Lexmark Canada and Hewlett-Packard Canada introduced photo-quality inkjet printers that you'll be able to buy for $150—or perhaps even a few dollars less.

Lexmark puts you in the Z zone

With a marketing message that is equating the "Z zone" with ease of use, Lexmark Canada unveiled two models in its new Z line of inkjet printers at a briefing session in mid-May The Z11 with an estimated street price of $149 offers the highest resolution and page per minute (ppm) printing speed in its class, according to Lexmark. It offers true 1 200x1 200 dot per inch (dpi) printing resolution and is rated at 4 ppm for black and 2 5 ppm for color, both in draft mode.

Lexmark says the Z51 which has an estimated price of $379, is also the fastest in its class, with a rated speed of 10 ppm black and 5 ppm color, both in draft mode It comes with parallel and USB ports.

The Z51 also offers 1,200x1,200 Plus dpi print resolution Lexmark said the "plus" means further improvements in image quality thanks to a new printhead design that releases smaller droplets of ink (seven picolitres) Because less ink is used, the paper wrinkles less, which means the printhead can be positioned closer to the paper, allowing it to place the ink droplets more precisely The result, Lexmark says is photo-quality output even on plain copier-grade paper from the Z51.



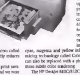
Lexmark Z11

Lexmark officials say paper handling is the single biggest problem for all printer manufacturers Both the Z11 and Z51 incorporate a paper-feeding mechanism called Accu Feed which the company says significantly reduces paper feeding problems

TCP had the opportunity to see print samples from both the Z11 and Z51, and we were impressed The image quality was very good, and the fact that it was achieved, in the case of the Z11 with a $150 printer was all the more remarkable

HP photo Deskjets

Two weeks after Lexmark introduced its new printers, Hewlett-Packard Canada offered some budget photo inkjet solutions of its own two new photo-quality inkjet printer series, one of which matches the Lexmark Z11's $150 price point



HP DeskJet 612C

The Deskjet 610CL/612C printers will sell for around $149 (although that price is met after the purchaser receives a mail-in rebate of US$30) and up according to HP The 612C prints up to 5 ppm for black text and up to 2 5 ppm for color, while the slightly slower 610CL is rated at up to 4 ppm for black text and 1 ppm for color. Both printers have two-cartridge designs (one for black ink and another containing cyan, magenta and yellow inks) and use an HP color-optimizing technology called ColorSmart II The black cartridge can also be replaced with a photo cartridge, which provides more subtle color rendering

The HP Deskjet 810C/812C printers will cost around $299 and up, and include both a parallel and a USB port. The series is rated at up to 6.5 ppm for black and 4.5 ppm for color.

This line also uses HP's PhotoREt II color layering technology Although we haven't seen samples from this printer, we've been impressed with the output from other HP printers that use the PhotoREt II According to HP, the technology "blends tiny drops of ink resulting in a broad range of realistic colors and improved image quality"

—*David Tanaka*

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Word games enhance vocabulary

By Jean Allen Ikeson

Young children who are just learning to read seem to have an insatiable appetite for reading and playing games that develop reading skills. If you are a parent, however, you also know that by the time these same kids reach 10 or 11, the enthusiasm has been replaced by groans.

Reading Blaster Vocabulary
From: Knowledge Adventure
Tel: 800-542-4240 (Educators 800-545 7677)
http://www.KnowledgeAdventure.com
For: Windows/Power Mac
Price: $29.99

Kids in this group have mastered the fundamentals of reading, but are still working on decoding new words and extending their reading vocabulary. It always surprises me how often they pronounce new vocabulary words like they were in some language out of *Star Wars*.

With this problem in mind, Knowledge Adventure has released a new game called Reading Blaster Vocabulary that improves reading and vocabulary skills. Knowledge Adventure has become adroit in making boring topics entertaining and the developers have surpassed themselves with this new title.

For kids in Grades 4 through 6, this game focuses on teaching reading comprehension, parts of speech, vocabulary and sentence construction while the players attempt to find six missing people in a creepy old mansion—it's sort of a cross between the *Addams Family* and an advanced version of Clue. Each time an exercise is completed, the player is rewarded with a clue. Finish all the exercises and solve the mystery and the player is treated with a ghost story.

The game has three levels of difficulty which will adjust to the player's level of success, always providing a challenge. I particularly like the game's use of reading for detail, drawing conclusions and using inferences—by poring through secret diaries, letters and journals—to build reading comprehension. More than 2,000 age-appropriate words are used to extend vocabulary skills.

A crossword puzzle-type activity offers definitions and possible word lists as clues but the player must type in the appropriate word. If it is misspelled, the incorrect letter will not print and the puzzle will not be solved until all squares are correct and complete. This single exercise develops spelling and vocabulary.

In another word puzzle, youngsters are asked to create the longest word possible to win a steeplechase. This challenge helps kids read and write complex words, while having fun.

This game also includes a sticker making activity in which kids can make and print out spooky stickers using the included Avery Inkjet sticker paper. Sounds like a good way to reward kids for finishing a mystery before they move on to the next level. ❑

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Mac OS 8.6 and beyond

Free upgrade provides incremental improvements

By Graeme Bennett

The first thing you'll notice about a computer running Mac OS 8.6 is the new startup screen. Other changes are less obvious—those who are expecting major changes may be disappointed.

Mac OS 8.6 (final)
From: Apple Computer
Tel: 888-295-0653 http://www.apple.com/macos
Release date: May 10, 1999
Price: Free for OS 8.5 or 8.5.1 owners who download it from the Apple Web site, or they can pay US$16.95 to receive the upgrade on disc (which includes several items not available in the download)
Summary: A new startup screen and a more commercial graphing calculator are the most obvious changes to this 26 MB patch, but there's more underneath the hood of this upgrade.

Upgrade highlights

- Improved power management functions allow portables to run longer on a battery charge and, according to some reports, can reduce operating temperatures by several degrees.
- The Open Transport networking features particularly DHCP (dynamic host configuration protocol) services, that became more troublesome for some users after upgrading to OS 8.5.1 have been refreshed. Also updated are AppleScript 1.3.7, ColorSync 2.6.1, and the Mac's LaserWriter driver.
- Sherlock includes new plug-ins and faster searches, plus the ability to search for words inside HTML and PDF files.
- A faster Java 2.1.1 interpreter (still 30 percent slower than Java for Windows, admits Apple chief executive Steve Jobs) is also included. (Already, Apple has released a 2.1.2 update.)
- The graphing calculator is, in some ways, worse. It recommends an upgrade to the commercial version 2 whenever it can't perform a function. The new demo is cool, though, and it can export movies of its 3D animated graphs (which are now accelerated by 3D hardware).
- Although not mentioned by Jobs in his keynote address at Apple's World Wide Developer Conference in mid-May when he announced the Mac OS 8.6 upgrade, it included support for UDF 1.5, providing file system support for DVD-RAM drives and similar devices.
- Problems with the ATI Rage 128 graphics card drivers supplied with the new blue-and-white G3s are largely resolved, particularly if the new ATI drivers included

*Continued on page **92***

HomeLINE links Macs to Macs and PCs

SAN LEANDRO, Calif (NB)—Farallon Communications Inc. has introduced a hardware and software bundle called HomeLINE that uses conventional phone lines to connect Macs to either other Mac or PCs.

The Macintosh platform has historically been easy to network, although for a long time it depended upon built in low speed networking technology called AppleTalk. Now HomeLINE utilizes an available PCI slot, plugging the computer into any standard phone jack and providing transfer [illegible] up to 1 Mbps.

Aimed at networking in the home and small office over phone lines, HomeLINE (which is based on the HomePNA standard) reportedly includes everything needed to connect computers in order to share Internet access, multi-player games, printers and files.

[illegible] include Mac and PC Internet sharing software to share a single Internet service provider (ISP) connection over an analogue, ISDN or DSL [illegible] Installation Wizards for Mac OS, Windows 95 and 98 to configure Macs and PCs, and dual phone-port support on the card which eliminates the need to install a separate phone jack for phone, fax or modem.

The HomeLINE Starter Kit includes two PCI cards, NetPack Software CD, two cables, QuickStart card and a user guide. It has an estimated street price of US$139. The HomeLINE Single Pack comes with one PCI card, NetPack Software CD ROM, one cable, QuickStart card and a user guide, and is priced at US$79.

Mac platform minimum requirements are a Power Mac with System 7.5.5, and 16 MB of RAM. PCs require a minimum of a Pentium processor with Windows 95 or 98 and 8 MB RAM. Also needed for both platforms are 18 MB free hard disk space, a free PCI slot, a CD-ROM drive and a telephone jack near each computer. ❑

[illegible] www.farallon.com

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Mac OS 8.6 and beyond

Continued from page 90

with Apple's Open GL 1.0 release are used. FireWire and USB support is also improved.

A summary of the upgrade's new features is available at Apple's Web site, and document 60230 in Apple's Technical Info Library provides additional details.

Compatibility

As with other OS releases, there are a handful of applications that conflict with the new release. Notably, according to O'Grady's PowerPage (http://www.ogrady.com), Freehand versions 7.02 and 8.01 crash with a Type 2 error message when launched. O'Grady's Nobeige.com (http://www.nobeige.com) reports that versions of Connectix VirtualPC (2.1.2 and earlier) will crash under 8.6. Some users also report problems playing DVD discs after upgrading to 8.6.

Also plagued by incompatibilities is the PowerPrint parallel-to-USB printer adapter, from Burnaby, B.C.-based Infowave. Fortunately, a 4.4 MB update patch re-establishes communication between the computer and printer. It is available from the company's Web site (http://www.infowave.com).

Although some reports cite incompatibilities with SoftArc's FirstClass software, our sources at Apple say they have run the latest client without apparent difficulties. Nevertheless, Ontario-based SoftArc (http://www.softarc.com) has posted an update.

Both MacNN (http://www.macnn.com) and MacFixit (http://www.macfixit.com) are following the topic of compatibility closely.

OS 8.6 tips and tricks

1. Press Command+Option+Ctrl and select About This Computer from the Apple menu. Notice that the text has changed to say "About the Mac OS 8.5 team." Presumably, the fact that it doesn't says 8.6 is a bug—albeit a harmless one.
2. Hold the Option key and select About This Computer to see an updated version of the Finder Mountains (unchanged from Mac OS 8.5).
3. If you want to save a movie without upgrading to QuickTime Pro, right-click on the arrow on the right side of the player and choose Plug-in settings, then choose Save Movies in Disk Cache. Retrieve the .mov file from your browser's designated cache directory before quitting your browser.

Attack of the portal radios

NB—Among the many portal sites you'll notice one thing—when one has a good idea, the others copy it within a month. Recently, both Yahoo and Looksmart announced new radio services modeled after the system announced several weeks ago by Lycos. Looksmart plans a daily hour-long talk show and Yahoo is offering 10 channels of non stop audio. Expect more services from other sites soon!

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4 Not included in the OS 8.6 download, but available on Apple's download page is a set of USB mass storage drivers (which you need Mac OS 8.6 to access) With these drivers, any number of compliant devices can be plugged in and will start working immediately without the need to install additional software

In addition to the mass storage drivers noted above, the CD version of Mac OS 8.6 includes the following features

- Apple Remote Access client 3.1.3 (requires Mac OS 8.6),
- AppleScript Extras 1.1,
- English Speech Recognition 1.5.4 (requires at least Mac OS 8.5),
- Open Transport Extras 2.0.3
- Disk Copy 6.3.3 (also posted on Apple's site),
- ColorSync 2.6.1 (also posted),
- Mac OS Runtime for Java 2.1.2 (8.6 comes with version 2.1.1),
- and G3 Firmware Update 1.1 (installs the same firmware as version 1.0.2)

What's ahead

Apple says Mac OS 8.7, currently code named Sonata, will continue the evolution toward Carbon API compatibility It includes an enhanced version (2.0) of Apple's Sherlock "metasearch engine," which has LDAP (lightweight directory access protocol) address book support allowing you to search for people across the Internet, plus an e-commerce-oriented search facility that shows products, prices and availability of products for Internet shoppers Apple says its goal is to make the Mac OS the easiest way to search for information people or products on the Internet

The new Sherlock features the same sort of interface stylings as Apple's recently released QuickTime 4.0 player (The icon-heavy interface of the latter is not universally liked due to the omission of classic Mac window controls such as minimize buttons)

Also slated to appear in Sonata is the recently missing-in-action "keychain" Apple is now refashioning this feature, which was present in System 7.5, into a network login manager (complete with a "voiceprint login" option) that will allow different users to have their own preferences, desktop settings default Web browser document folders, and other settings Network login features have been part of the Windows environment (and the Apple education community) for years It's good to see Apple providing this functionality to its base of Mac users, many of whom share a single computer with classmates or family members ❑

Blocked site of the day

NH—Everyday, Peacefire runs this illuminating feature that highlights some of the sites that manage to make it into the blocking filters of some Internet filtering software The point? Blocked sites aren't all sex and violence and companies the software makers can't explain why they were ever blocked. From the Youth Alliance Against Internet Censorship

http://peacefire.org/BSOTD/

Apple's advances unveiled at WWDC

By Graeme Bennett

At Apple's World Wide Developer Conference (WWDC) in San Jose Calif., in mid May, chief executive officer Steve Jobs revealed a number of developments in Apple Computing hardware and software Among the highlights:

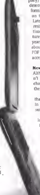
- Apple announced that Dragon Systems' market-leading NaturallySpeaking speech recognition software is coming to the Mac platform later this year.
- Jobs announced a 400 MHz version of its DVD-equipped PowerBook G3 that is slightly lighter at less than 2 7 kg (6 lb) yet delivers better battery life—up to five hours from one battery or a whopping 10 hours from a dual-battery configuration
- Apple has posted Mac OS 8.6 for free download by Mac OS 8.5 users
- QuickTime Streaming Server software is available as "open source," which means other companies can add it to their server platforms for video and audiostreaming at no cost.

During the many demos in Jobs' two-hour keynote address, several never-before-seen technologies were unveiled Apple announced that its own implementation of Open GL, a standard 3D graphics API, is now available for immediate download.

A cool flight simulator called X-Plane that was also demonstrated during the keynote, showed off some features included of the next release of Mac OS code named Sonata Sonata includes an enhanced version of Apple's Sherlock "metasearch engine " (See Mac OS 8.6 review in this issue for details on Sonata and Sherlock)

Jobs also discussed ongoing development efforts for the client release of Mac OS X (ten), including integral support for Adobe's portable document format (PDF), a new PDF-and-LDAP savvy mail client and a Finder that is strongly reminiscent of the NeXT file browser.

The new graphics imaging engine, known as Quartz will make the Mac OS the first mass-market operating system to include compositing features pioneered at Pixar (Jobs' other company) 15 years ago, according to Jobs. In another demo, Apple showed the new graphics engine performing real-time soft shadows behind text typed on top of a TIFF image, with full anti-aliasing Later an imported PDF graphic was rotated, resized and made partially transparent, all in real time While very cool, we recall seeing similar features in a NeXT Dimension demonstration several years ago It's also safe to expect a few complaints about the large size of email files with embedded PDF enclosures at least until broadband Internet access is ubiquitous.



Apple's new PowerBook G3

New names for OS components

Although Apple says its development strategy hasn't changed since last years WWDC, Apple has changed the names of a number of components in the new OS

Gone is the confusing Blue Box terminology that signified classic Mac OS compatibility mode in the Mach/BSD Unix-based OS X. Now, Apple simply calls it Classic

Another Apple technology given a new spin is the Mac OS X application interface model formerly known as Yellow Box which is now referred to as Cocoa (This is apparently unrelated to the Cocoa programming language for children Apple developed then quietly dropped just after former chief executive Gil Amelio was given the big shoe)

Apple says Developer Release 1 (DR1) of the Mac OS X client is available now, with DR2 expected in the fall and a final version due before May 2000

No shows

There was no announcement of the long awaited "consumer portable" that was announced last year (it is still promised for release this year) Nor was the rumored 1 35 kg (3 lb) "ultraportable" PowerBook shown or mentioned.

The new PowerBook G3 that was unveiled is an incremental upgrade to the existing G3 models and includes USB connectivity, a redesigned cooling fan and better battery life, all in a package that's lighter and Apple boasts, two to three faster than the fastest Pentium II portables Apple Canada says the new PowerBooks are available from Apple authorized resellers in the following configurations.

- A 333 MHz version with 512KB cache, 4 GB hard drive, 14.1-inch TFT display 24x CD-ROM drive Ethernet and a 56Kbps modem has an estimated retail price of $3 699
- A 400 MHz version with 1 MB Level 2 cache, 64 MB RAM, 6 GB hard drive 14 1-inch TFT display, 2x DVD-ROM drive, Ethernet, and a 56Kbps modem has an estimated retail price of $5,199

Additional build-to-order options for the new PowerBook line are not available in Canada.

QuickTime keynote overload

QuickTime 4 0 video MP3 audio and live streaming features were prominently featured during the keynote demos. However users unable to attend the live session or its remote satellite broadcasts may have been disappointed by the performance of the live Web cast of the event, streamed via QuickTime 4

Due to heavy server loads the remote broadcast frequently broke up and at one point stopped entirely This isn't necessarily Apple's fault—it says its popular servers have served more than 200 terabytes of data since the *Star Wars: Phantom Menace* trailers were first posted

The company took advantage of the current *Star Wars* mania among its target audience to show the movie preview in its entirety It also got in a few digs at Microsoft, with another in its series of HAL 9000 spoofs This time, HAL announced he was based on code developed in Redmond, Wash , and, while he was more advanced than HAL 95, confessed that he still lacked people skills, such as those found in the Mac OS. Predictably this was a big hit with the crowd of Mac developers.

Jobs didn't spend much time on Mac OS 8 6 highlighting only a few features, such as its improvements in DHCP (dynamic host configuration protocol), AppleScript, ColorSync, a faster Java interpreter (still 30 percent slower than the latest release of Java for Windows, Jobs admitted) and an enhanced LaserWriter driver. ❑

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INSTAbase simplifies Web databases

By Jacques Surveyer

INSTAbase is a curiosity—a shareware database that is managing to garner top-notch reviews despite competition from such shareware stalwarts as Buttonware PCbase and others What does INSTAbase bring to the table? Simplicity, ease of use and Web-ready deployment.

INSTAbase 4.0c
From Esenet Inc.
940 80 Eglinton Ave E, Toronto ON M4P 2Y3
Tel 416-482 3037 http://www.instabase.com
Price $80

Summary INSTAbase supports quick creation of single-table Web databases

Pros Simple to setup and use; works well on small simple databases reports and Web sites.

Cons: Crude capabilities for validation, querying and filtering No multi-table functions.

In the Web arena, INSTAbase is filling a gap that other so-called easy-to-use products such as Allaire's Cold Fusion or Everyware's Tango just can't touch With INSTAbase you can have a database up and running on your Web server in 20 minutes However with this speed and ease come some distinct limitations in what the final database can do

Simple to use

INSTAbase earns top marks for ease of use With one tab page and five steps, users can create and update a simple single table database

Want to change the field label from Description to Commentary? Just click on the Description and type in Commentary and a Save Labels button pops up Click on it and the field label is changed Try that with your SQL or or Web databases

INSTAbase allows for 104 database fields in each table even though most users will only use five to 10 fields The fields Created and No are built into every database They automatically date and number each new record as it is created in a database The interface also includes one field for a graphic image and one for a memo for each INSTAbase record Fortunately if these fields are not used they don't take up much space

After defining the fields in a table it's very easy to start inserting records using the navigator bar and record insertion controls To start entering data into the input form, just click on the ➤

Apple sticks with OS X

SAN JOSE, Calif (NB)—For developers the big news at Apple Computer's Worldwide Developer Conference held in mid May was that the firm will stick with the Mac OS X operating system and will not switch to a new strategy

Apple settling on OS X, at least for the immediate future, was taken as the signal that firm has finally arrived at a stable OS strategy It was news because Apple has changed course in midstream regularly over the past couple of years

The lack of a stable charted course had left some developers unwilling to commit resources to what one developer disparagingly described as "the OS of the month "

The firm abandoned at least two earlier attempts to create a successor OS to the Mac OS 8 generation. First, a system code named Copland was abandoned as having grown too large and ungainly Then a year ago, the Rhapsody OS acquired from Next Computing, was largely abandoned though strains of Rhapsody still run through the OS X Server version

Though elements of Rhapsody remain many developers liked the OS on its own well enough that the decision to scuttle it resulted in rumors—some published—of intentional sabotage by outside investors or partners Also some reports have blamed Apple's abandonment of Rhapsody for a "brain drain" of non-Windows developers to other platforms notably Linux and Palm Computing.

In his address to the developers Apple's chief executive Steve Jobs made a joking apology for dropping the "strategy a year" approach adding that he hopes timely implementation of the current strategy will serve as a suitable substitute

Developers were generally impressed with OS X as demonstrated at the conference A preview version has been made available to developers who want to start working with it. One of the largest components of the new OS, the Finder interface for managing files and resources, has been rewritten to the new API (application program interface) set used by OS X. Many less visible, lower-level software components or modules also are nearly ready, according to reports

Apple says it will take a two-tiered strategy to the OS, offering both professional and consumer versions somewhat like Macrosoft's Windows NT and Windows—which serve different markets The consumer version will run current Mac programs, though upgrades will be needed to take advantage of all features. ❑

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yellow "+" button INSTAbase doesn't make a distinction between numeric date, string or other field types This makes it easy to enter data, but hard to catch mistakes because INSTAbase doesn't provide prebuilt or user-defined validations for data entry

INSTAbase provides two ways of importing data into the predefined graphics image and memo fields Images or blocks of text can be imported by browsing and opening files or by pasting from the clipboard If you need more than one memo field, you can combine two or more fields (each field can contain up to 100 characters), but as you can see, things get complicated quickly if your requirements vary from the INSTAbase norm.

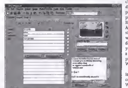
Querying, searching and reporting

INSTAbase provides two mechanisms for searching and querying

Click on a radio button and one of the first seven fields, or the comments fields, will be searched for the string you have entered into the Search By field. Click on the Find First button and it will find and display the first record that contains the Search By string Compared to SQL and other database queries this is a fairly rudimentary searching mechanism.

In contrast if you click on the report tab, INSTAbase provides a better, but still limited, search and filtering mechanism It allows any or all of the fields to be searched and/or filtered.

However, if more than one search condition is used the connector is assumed to be "and" Thus a report printing all records meeting the condition "name contains 'Art' and description contains 'first'" is easy to do in INSTAbase. But a condition such as "name contains 'Art or name contains Wright'" is impossible to do in INSTAbase



So the simplicity and ease of use come at the price of not being able to do nearly all of the queries validations and filtering that one is accustomed to with a SQL or enterprise database

The Web payoff

Many users want to provide simple database capabilities on their Web sites—one table, no updates, just an interface that allows their users to browse through their data—and INSTAbase delivers This Web database browsing capability is provided by a Java servelet that, in addition to forward and backward navigation, allows for keyword searches for specific INSTAbase records.

The Publish-to-Web wizard makes it dead simple to do choose the database choose the fields to be displayed, set some simple formatting and display options, then publish it on your Web site All you need is the Web site address, logon password and INSTAbase does the ftp transfer for you In 10 minutes I had a 200-record database of photos installed on my Web site.

But the trade-off here is that you lose control of field layout on the Web page You have to settle pretty much for the INSTAbase layout

Also, it's not possible to edit, delete or insert new fields into the Web database This is because INSTAbase exports the database to the Web server as a simple comma-delimited file with specially named image (for graphics) and text (for the memo text) files The Java servelet becomes the database engine for a flat file database on the Web

Conclusion

INSTAbase is an adequate, but not stellar database application for the PC environment It adds real value by simplifying publishing of database tables to the Internet, but this means loss of significant formatting control of Web databases, and no update delete or insert features

Is it worth $90 to be able to publish a small to medium size read-only database table to the Web? Well all the other Web database engines I'm familiar with cost two to five times as much and will take at least an hour or five to create and post on the Web

In sum, INSTAbase has found a market niche that I suspect will be filled with contenders in short order ❑

Jacques Surveyer is a computing consultant and writer he can be reached at jlsurv@sympatico.com

Arctic studies centre

NB—The Arctic Studies Centre is a new program of the National Museum of Natural History of the Smithsonian Institution in the U.S The centre is dedicated to the study of northern Pacific Rim peoples their history and environment and the Web site brings some of this research to Internet users You can travel through the Hall of the Peoples, into the exhibit of Siberian and Alaskan Masking Traditions and into the newest room, the 2000-year-old Tomb of a Siberian Shaman

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Adobe launches GoLive 4.0

HONG KONG (NB)—Adobe Systems has introduced GoLive Version 4.0, a cross-platform version of its visual Web design and publishing tool for both Macintosh and Windows.

GoLive 4.0 is the first Adobe product upgrade based on GoLive Systems CyberStudio (acquired by Adobe earlier this year) that offers Web authors the tools they need to design and produce Web sites for electronic commerce and other applications.

According to Adobe, the product gives Web designers pixel-level control over hypertext markup language (HTML) in a visual design environment while automatically generating industry-compliant HTML code.

Working in Layout mode allows Web designers to see exactly how their designs look on different platforms and browsers, while Adobe GoLive's advanced site management tools also make it easier to create and maintain Web sites.

New functions include cross-platform and cross-browser support; robust site management; a flexible authoring environment that includes a familiar layout grid and "drag and drop" metaphor; ready-to-use JavaScript actions that offer instant interactivity without programming; a rich studio of editors: the DHTML Timeline Editor, redesigned Movie Editor for QuickTime 3.0; Cascading Style Sheets (CSS), and emerging Web technologies like the Extensible Markup Language (XML) and Microsoft's Active Server Pages (ASP).

GoLive 4.0 for Macintosh and Windows is available for US$299, or US$99 for the upgrade. It is slightly cheaper—US$279.99 for the full version and US$69 for the upgrade—if downloaded from the Adobe site. The downloadable version includes Adobe PDF documentation. You can also elect to have the documentation mailed to you.

Adobe offers a special price (US$199) for those who own Photoshop, Illustrator, Macromedia Dreamweaver or Microsoft Front Page. If you own PageMill, an upgrade to GoLive 4.0 is only $99. ❑

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Weaving your own Web site: Part 46

An in-depth look at Cascading Style Sheets Part 5

By Keith Schengili-Roberts

Last month, we started to look at the font family of Cascading Style Sheet (CSS) properties This month we'll conclude our overview of this family of properties. The CSS font family consists of the following elements: FONT-FAMILY, FONT-SIZE FONT-STYLE, FONT-VARIANT and the parent property FONT, which can take on all of the features of its "children " We discussed how FONT-FAMILY worked last month, so we will pick up this month with the FONT-SIZE property

Not surprisingly, the FONT SIZE property is used to set the size of the text to be displayed. It can do this in any one of three ways by specifying the size relative to the default browser font relative to the last specified font size, or with a precise size value In many ways it operates in a very similar way to the HTML tag <FONT> when its SIZE attribute is used The FONT-SIZE CSS property however, provides greater flexibility than its HTML equivalent.

FONT SIZE can take seven specific name values for setting the size of the font displayed Ranging from largest to smallest, they are XX LARGE X LARGE LARGE, MEDIUM SMALL, X SMALL and XX SMALL. These settings are equivalent to the <FONT> tag using attributes ranging from SIZE-"7" to SIZE="1" The following code gives you an idea of how you can use these settings for FONT SIZE

```
<B STYLE="FONT-SIZE XX-LARGE">This sentence is
set in a double-extra big font size.</B>
<P>
<B STYLE="FONT SIZE XX SMALL">This sentence is
set in a double-extra small font size </B>
```

You can also set the font displayed to a value that is either one size larger or smaller than the base font size value being used This works in the same way you might set the HTML tag <BASEFONT> to a particular value, and then set the font size relative to that value (i.e. by using <FONT SIZE="+1"> or <FONT SIZE="-1">) This can be done in CSS by using the values LARGER and SMALLER as in the following example

```
<B STYLE="FONT-SIZE LARGER">This sentence is
set in one size larger than the default base
value </B>
```

Finally, FONT SIZE can also take on a percentage value The percentage value that is specified is relative to that of the size of the base font, where a value of 100 percent equals the size of the base font A value of 200 percent would make the font twice the size of the default font, as can be seen in the following code:

```
Some text displayed using the browser's default font
size.

<P STYLE="FONT SIZE 200%">
This line of text is set to FONT-SIZE 200% so it
should be twice the size of the default font size.
</P>
```

The FONT-SIZE property is fairly safe to use, as it is fully supported in Netscape Navigator and largely supported within Internet Explorer. The only difference is that Internet Explorer sets all of the named FONT SIZE values one size smaller than they should be so that the value SMALL is equivalent to the default value, when it ought to be MEDIUM This means that you can expect the named values to be displayed differently between the two major browsers

The FONT STYLE property

The FONT-STYLE element is designed primarily to tell a font that it should be displayed in italics It takes one of three possible name values ITALIC NORMAL and OBLIQUE NORMAL tells the browser to use the default (i.e non-italic) setting for a font. ITALIC and OBLIQUE are equivalent, and should display a font in its italic (or "oblique") setting

In essence this property is designed to supplant or at least augment the common italics HTML tag (<i>), and provides the value OBLIQUE for those fonts that do not understand the value ITALIC The following code shows how the three values for FONT-STYLE work.

```
<H2 STYLE="FONT STYLE: NORMAL">This is a nor-
mal header</H2>

<H2 STYLE="FONT STYLE. ITALIC">This is an itali-
cized header</H2>

<H2 STYLE="FONT-STYLE: OBLIQUE">This is an
oblique header (which should appear the same as
the italicized header above)</H2>
```

This property is fully supported in Internet Explorer, but only NORMAL and ITALIC are recognized within Netscape Navigator. This is one of those CSS properties where you really have to wonder why anyone bothered to create it. It was likely created to round out the various font family properties, but it is highly unlikely to replace the <i> tag in usage, as the tag form is much easier to remember and to write than its CSS equivalent.

The FONT-VARIANT Element

FONT VARIANT is a rather obscure name for a CSS property that essentially determines whether or not a font should be displayed in small capital letters (better known as "small

Continued on page **102**

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Mormon Church, Broderbund offer new tools for family roots sleuths

SALT LAKE CITY, Utah (NB)—The Church of Jesus Christ of Latter Day Saints—more commonly known as the Mormon Church—has formally opened its family genealogy Web site for people who use the Internet to trace the roots in their family trees.

The Mormon Church's new site adds to an already rich landscape of genealogy information available via the Net The site http://familysearch.org, is already described as the largest genealogical database on the Internet. The Net is widely used for "roots mania"

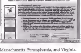
And it appears to be one of the Net's most popular sites Web site builder LavaStorm said the site was generating up to seven million daily hits in its test phase, and it expects 10 million to 15 million hits after the site's formal launch

More than 400 million names are indexed at the Web site, Mormon Church officials said. The church's Family History Department helps in genealogical research with what it calls the world's largest collection of family history records made available to the public through a system of 3 200 Family History Centres located around the world The Family History Department was established in 1894, and has collected millions of microfilms thousands of microfiche files and books and many other records.

The site is currently free to use And although officials said it's possible a charge a may be imposed in the future any proceeds would be used only to cover costs, not to generate profits.

GenealogyLibrary com

Also new and of interest to amateur genealogists (especially those with roots in the U.S), is a new subscription service from the Learning Co s Broderbund Home Division The GenealogyLibrary com service launched in May provides access to "actual images of census records from the 1800s" More than 200 000 images from the 1850 U.S Census are available through the service including records from nine states including Massachusetts Pennsylvania, and Virginia.



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- the U.S Social Security Death Index which includes 55 million names and is considered one of the largest genealogy databases available
- the U S Geographic Names Information System, a database that contains at-a glance information on more than 1 5 million current places in the U.S ,
- and a Vital Records Assistant, a tool for ordering original records and documents online by locating the correct agency or vital statistics bureau

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Weaving your own Web site: Part 46

Continued from page 99

caps") There are only two values for FONT VARIANT: NORMAL (the default value) and SMALL-CAPS

The following code gives you an idea of how it works:

```
<H2 STYLE="FONT VARIANT SMALL-CAPS">this text is displayed in small caps</H2>
```

At the moment this property is not supported in Netscape Navigator but it is within Internet Explorer, with the caveat that it doesn't display true "small caps," just capital letters where required.

The FONT-WEIGHT element

The FONT-WEIGHT property is used to set the "thickness" of a given font. Think of it as the "bold" counterpart to FONT-STYLE (which tells a font to be displayed in italics) though with more options.

There are three ways to set FONT-WEIGHT as an absolute value ranging from 100-900, as a relative measure to the default value, and using an absolute name value.

The absolute numerical values for the weight roughly correspond, in typographical terms, to the following series of values from lightest to heaviest: BOOK, MEDIUM, BOLD HEAVY BLACK and EXTRA BLACK. There is no one-to-one correlation to all of these values in the major browsers, so each will interpret some of the values differently, which according to the CSS specification, is okay. Here is an example of the "lightest" and "heaviest" values for FONT-WEIGHT being set:

```
<P STYLE="FONT WEIGHT 100">Line of text to
FONT WEIGHT 100 </P>
<P STYLE="FONT WEIGHT 900">Line of text to
FONT WEIGHT 900 </P>
```

Unfortunately the major browsers only recognize a few of these values, so this use of FONT WEIGHT is currently not recommended.

FONT WEIGHT also has the two relative name values BOLDER and LIGHTER, which work in the same way as LARGER and SMALLER, where BOLDER makes the selected text heavier than the default, and LIGHTER does the opposite. Internet Explorer supports these value but Netscape Navigator does not.

Finally, FONT WEIGHT also supports two absolute name values: NORMAL and BOLD, which do what you would expect, turn bold "on" or "off." The following code gives you an idea as to how it works:

```
<B STYLE="FONT WEIGHT NORMAL">Despite the fact that this line is contained between a set of bold tags, the text will not be bolded </B>
```

Both of these values are supported in the latest versions of Internet Explorer and Netscape Navigator. ❑

Next time we'll explore the HEIGHT LETTER-SPACING and LINE-HEIGHT CSS properties.

Keith Schengili-Roberts welcomes any comments, suggestions or HTML tips you may have. You can email Keith at: robertsk@wave.home.com. Look for his recent book on HTML, *The Advanced HTML Companion 2nd Edition*, co-authored with Kim Silk-Copeland (ISBN: 0-12-623542-2), which is now available in bookstores. Previous articles in this series can be found at *The Computer Paper* Web site at: http://www.tcp.ca/

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[illegible] 40/50X	$78/106
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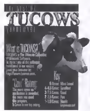
Capturing screen shots

By Scott Swedorski

Finally managed to frag the undefeated guy in a Quake II deathmatch? Created a Terran base that's a work of art, and kicked the Starcraft AI's rear end at the same time? Or maybe you just want the technician answering your email—who doesn't seem to believe your description of what your computer's doing—to see exactly what you're seeing. For these and a thousand other situations, you need a screen capture. Keep any of these programs handy, and a permanent record of what's on your screen is only a few key strokes away.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Capture Professional

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Version: 4.1
Revision date: March 31, 1999
Filename: cp4demo.exe
Byte size: 701,283
Licence: Commercial Demo
Cost: $44.95
Home page: http://www.creativesoftworx.com
Also available: Windows NT Version

Capture Professional lets you capture full screens, active windows, dialogue boxes, icons, mouse pointers and even menus. It can also acquire images from the keyboard, by extracting embedded images from programs or from TWAIN scanners. It also has built-in editing tools and special effects, allowing you to modify your screen captures without opening a different image-editing program. Capture Professional can save screen captures in 11 different file formats.

CaptureEze97

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Version: 6.96
Revision date: March 22, 1999
Filename: capez.exe
Byte size: 1 460 704
Licence: Shareware
Cost: $34.95
Evaluation period: 45 days
Home page: http://www.screencapture.com/
Also available: Windows NT version

CaptureEze97 is a fully automated screen capture utility: just press your Print Screen key and CaptureEze97 will do the rest. It also has Basic editing tools for cropping and flipping images, changing colors, and adding shadows, frames and text to your images. CaptureEze97 also has built-in thumbnail viewing and cataloguing, which can save you a lot of time, and it allows you to print tabloid- and poster-sized images on any printer. CaptureEze97 supports 18 different graphics formats.

HyperSnapDX

🐄🐄🐄🐄🐄

Version: 3.3
Revision date: Jan. 4, 1999
Filename: HySnapP.exe
Byte size: 1 136 920
Licence: Shareware
Cost: $25
Evaluation period: Unlimited
Home page: http://www.hyperionics.com
Also available: Windows NT version

HyperSnapDX is an extremely powerful program. In addition to the usual desktop and active window screen captures it can be programmed to automatically capture and save images at pre-set intervals. It can also capture DirectX and 3Dfx Glide programs and even screensavers, with a press of the Print Screen key or any hot key you define. HyperSnapDX's basic editing features allow you to crop, resize, change color depth, convert to grayscale or dither to black and white. It can also acquire images from TWAIN scanners and digital cameras, and allows you to save the images in 20 different file formats.

Kleptomanie

🐄🐄🐄🐄🐄

Version: 1.4
Revision date: March 18, 1999

➤

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[illegible]

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Filename Klepto.exe
Byte size 361 384
Licence Shareware
Cost $29.95
Evaluation Period. 21 days
Home page http://www.structurise.com/kleptomania

Why didn't someone think of this before? Kleptomania uses OCR (optical character recognition) technology to copy text from clipboard-unaware programs to the clipboard, and treats it like plain text. For example, use it to get a directory list from Windows Explorer without having to type everything yourself. It can also automatically launch URLs or send the captured text to a search engine or email client.

PrintScreen95

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Version 7.0 build 16
Revision date Oct. 8, 1998
Filename psf570.exe
Byte size 2 943 253
Licence Shareware
Home page http://www.ssmware.com
Also available Windows NT version and 16-bit version for Windows 3.1

PrintScreen95 takes your Print Screen key back to where it was in Windows 3.1: press the key and a shot of your screen is automatically printed out. It also allows you to capture the screen to the clipboard. The Select Area option lets you draw a rectangle using the mouse and print or copy the image within the rectangle. PrintScreen95 also makes screen captures of Protected-Mode DOS games (like Quake, Doom and Hexen) as simple as pressing a single key.

Snag-It

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Version: 4.3.1
Revision date Feb. 1, 1999
Filename snag3243.exe
Byte size 1 654 531
Licence Shareware
Cost: $39.95
Evaluation period. 45 days
Home page http://www.techsmith.com/
Also available: Windows NT version

Snag-It is an excellent utility that will capture just about everything in a snap, including images, video and text. The Active Capture feature will capture the entire contents of scrolling windows, such as Web pages. Snag-It can send the capture to the clipboard, a printer, an email client, or save it as a graphic file (the program supports about 20 formats) with the press of one button. The program allows image manipulations such as blur, emboss, flip, rotate, decrease color resolution and scale.

Macintosh Picks

Screen Catcher

🐄🐄🐄🐄

Version: 1.0
Revision date. May 7 1997
Filename tucows_screencatch.hqx
Byte size. 644,465
Licence Shareware
Cost. $25
Home page: http://www.stclairsw.com/ScreenCatcher/index.html

Screen Catcher is a small, easy-to-use utility that can save the capture automatically, send it to the Macintosh clipboard or open it in Screen Catcher's own window for further editing. The editing functions are limited to changing the color palette or depth. Files can be saved in PICT GIF (transparency and interlaced supported), or JPEG (including progressive JPEG) formats. Screen Catcher can capture pull-down menus too.

Snapz Pro

🐄🐄🐄🐄🐄

Version 1.1.1
Revision date Jan. 24 1999
Filename tucows_snapz.hqx
Byte size 950 229
Licence Shareware
Cost: $20
Home page http://www.AmbrosiaSW.com/

One keystroke brings Snapz Pro's palette up, allowing you to capture, trim, crop, scale and dither any portion of your screen. Snapz Pro was designed with Web publishing in mind, storing captures in GIF and JPEG formats, in addition to the native Macintosh PICT format. It also automatically stores height and width information for HTML image tags. With Snapz Pro, you can capture any rectangular area of your screen, eliminating the need to crop your screen captures after they are taken. The captures are stored in a Screen Snapz folder, which is easily accessible from the Apple menu. Snapz Pro captures almost anything on the screen, including menus, dialogue boxes and mouse pointers.

Capturing conclusions

It bears repeating that none of these programs should be used to violate someone's copyright. While Web sites with screenshots of Quake or Starcraft are common and more or less encouraged by the companies that create the games, screen captures of copyrighted works of art or writings should not be posted without the permission of the copyright holder. If in doubt, seek out permission from the copyright holder before you post or distribute any screen capture. ❑

Guide to Internet radio

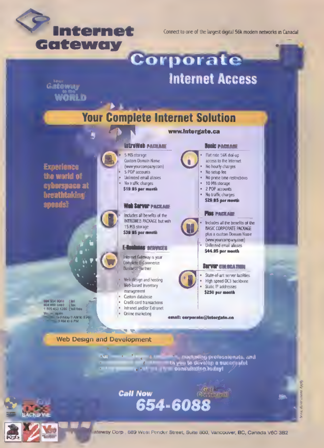
NB—Internet.com has launched a new guide to online radio stations. The Internet Radio Guide covers more than 1,300 radio stations that stream programming over the Web, Internet-only broadcasters and other live audio feeds online. The list can be browsed by program type, [illegible] name and location.

http://www.internetradiolist.com

Java power your Web site

NB—For anyone who is interested in Java programming and wants to use applets on their Web sites, JavaPowered includes a basic tutorial to Java, a library of applets that can be downloaded and used on your site, online games and more.

http://www.javapowered.com



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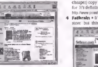
10 Web sites for bookworms

By Keith Schengili-Roberts

Looking for a summer read? Need a textbook for next September's classes? Looking for a particularly hard-to find book? Chances are good that you will find what you are looking for online. Easily the most successful enterprises to have hit the Internet are online bookstores, the largest of which offer more titles than could easily fit into a single store. Take a stroll through the virtual aisles with this listing of online book stores.

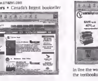
1 **Amazon.com** • It would be impossible



to have a list of online bookstores without mentioning Amazon.com, the undisputed champion of online bookstores. If the book you are looking for has been in print in the last 10 years or so, you will at least find a reference to it here, though you are better off getting more recent titles from this site. Though it began with books, this site has branched out to sell music, gifts, and includes an auction area. Also worth mentioning as excellent sources for British and German titles are sister sites Amazon.co.uk and Amazon.de.

http://www.amazon.com

2. **Chapters** • Canada's largest bookseller



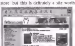
has dropped its association with *The Globe and Mail*, which means you no longer have to remember the hybrid domain name chaptersglobe.com. Chapters' selection is not as extensive as Amazon.com's, but if you can find it here you won't have to pay in American dollars.

http://www.chapters.ca

3. **Powell's** • Powell's, a legendary store located in Portland, Ore., is the world's largest new and used bookstore that buys more than 3,000 used books a day. When you shop online here, there is a good chance you can find a used (hence cheaper) copy of the book you're looking for. It's definitely worth checking out.

http://www.powells.com/

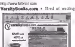
4 **Fatbrain** • It's a dumb name for a bookstore, but this is definitely a site worth



browsing if you are looking for professional texts on computers, science, technology or related subjects. If you are a programmer, mathematician or are attempting to become certified in your chosen field, check out Fatbrain.

http://www.fatbrain.com

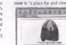
5. **VarsityBooks.com** • Tired of waiting



in line the week before classes start to get the textbooks you need for your course? Particularly handy at this site are the comprehensive listings of the books required for courses at various universities. This doesn't currently include Canadian universities, but it is probably only a matter of time.

http://www.varsitybooks.com

6. **Woozles** • Located in Halifax, this book store is "a place for and about children."



The site includes handy things like summer reading lists, suggested titles for children with reading problems, and children's books in French. It also has listings of Canadian picture books and books specifically for infants, and preschoolers.

http://www.woozles.com

7. **Nebula Books** • Need an escape into

space or fantasy? This is the online version of Nebula Books, Montreal's only specialty science fiction bookshop. It has an extensive selection of the best sci-fi and fantasy titles, and also offers a selection of crime fiction, art books, film and video guides, graphic novels, myths and urban folklore.

http://www.nebulabooks.com

8. **Whodunit Canada** • Located in Winnipeg, this bookstore offers the latest crime fiction, mystery thrillers and hard-boiled detective stories for its readership. The store's Web site has interesting lists devoted to collectible books, as well as British and Canadian mystery titles.

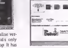
http://www.whodunitcanada.com

9 **Hugh Anson Cartwright· Fine Books, Maps and Prints** • This site is

a boon to people who collect antiquarian books. Sites like this offer new outlets for experienced specialty booksellers to reach a wider audience. This particular bookseller has been serving collectors and libraries for over 30 years, and he offers lists of rare and antique books in subjects like Canadiana, Arctic, Literature, Canadian Art, Voyages and Travels. There are many antiquarian booksellers now online, but this one is more in tune than most with selling on the Net.

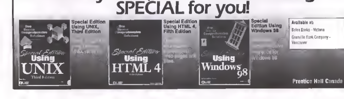
http://www.interlog.com/~hac/

10.**Canada Computer Books** • If you are



looking for a computer book, then this Canadian retailer's site is worth perusing. Its titles range from simple step-by-step guides for novices to advanced programming and development books for professional developers, administrators, and programmers. The site is simple and low-key, but if you are looking for a recent computer book, chances are you'll find it here.

http://www.misscompute.com ❑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Guide an essential tool for Java 2

By Keith Schengill-Roberts

Programming in Java has really come into its own. If you are a programmer or a user, the promise of "write once, run anywhere" is a compelling reason to deploy Java in corporate environments where there may be many different machines running different operating systems, all of which need access to the same programs. It is also arguably a much "cleaner" programming language than C and C++. Java is easier to read, to debug, and it does its own "garbage collection," which means you don't have to free up memory formerly allocated to such routines.

Java is also relatively easy to learn, which has made it popular among the growing core of new programmers. One of Java's perennial weaknesses, however, has been the relatively primitive user interface that comes with the standard free toolkit from Java developer, Sun Microsystems. Sun's solution is Swing, the name given to a bunch of new interfaces introduced with the recent release of Java 2. This new book from O'Reilly and Associates—which is heavy enough to crush bugs, both real and virtual—focuses on Swing.

Java Swing
Author: Robert Eckstein, Marc Loy and Dave Wood
Publisher: O'Reilly and Associates
Tel: 800-998-9938 http://www.oreilly.com
ISBN: 1-56592-455-X
Softcover 1,155 pages 1998
Price: $65.95
Rating
Information content: ****
Readability: ***
Intended for: Intermediate / Expert
Overall rating: *** 1/2

Java Swing is huge: 1,155 pages of text, and a thorough 64-page index. It provides a detailed look at all of the new Swing components, allowing programmers to build state-of-the-art interfaces and giving them the context needed to understand the coding.

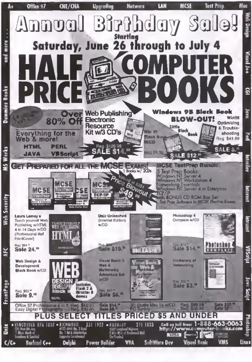
This book is not for reading from beginning to end—it's a reference for Java programmers. *Java Swing* assumes readers understand Java, as well as the AWT (Abstract Windows Toolkit) and GUI (graphical user interface) programming in general. Having said that, those who are just starting to work in Java but who have some programming experience will get a lot out of the first three chapters, which introduce basic Swing concepts and teach readers how to write a basic Swing-based application.

After outlining the fundamental concepts of Swing, the book progresses into each of the components and different subsystems in stomach-wrenching detail, with the type of focussed tutorial/example material programmers demand. Subjects thoroughly covered in this book include bounded range components, Swing containers, trees, tables, and dialogues. The final sections of *Java Swing* deal with advanced topics, such as pluggable look and feel elements, customizing components via renderers and editors, plus creating custom components.

This is a great book for Java developers. However, if you are trying to hunt down a copy, make sure you get the most recent version. The review copy I received was based on a beta version of Swing so all the code references point to the beta-era package name used for Swing (com.sun.java.swing instead of javax.swing). Look for a version printed December 1998 or later—such versions are apparently up to date. But if you do buy the beta-era version you can find extensive errata at the publisher's Web site.

This is another excellent book from O'Reilly and is pretty much essential if you are programming in Java 2. Java Swing helps you to take full advantage of the Swing classes, providing detailed descriptions of every class and interface in the key Swing packages. A good book and an effective tool to aid you in your Java programming efforts. ❑

Keith would like to thank Java programmer Ethan Henry for his help in reviewing the technical aspects of the book.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In brief

Free Internet stream ticker

VANCOUVER (NB)—AlphaTrade.com has taken the wraps off AlphaTicker the first in a series of E-Gate Java-driven applications the firm plans to offer via its Web site

AlphaTicker, as the name implies, is a PC-based stock ticker. However, unlike the stock ticker on Pointcast for example, the ticker program itself is coded in Java.

This means the Java window can be dragged and dropped from a Web browser onto the users desktop

According to the firm, users will be able to download the Java application and install in on their PCs. Like Pointcast the ticker can then run independently of a live Internet connection based on the most recently downloaded set of data. Users will then be able to auto-update the ticker each time they log on to the Internet

According to Rafael De Noyo, AlphaTrade's chief technology officer the ticker is the first in a series of offerings the company plans to release under its AlphaWare/E-Gate brand name

Other AlphaWare applications planned for later this year include word processing spreadsheet functions, and live streaming video

AlphaTrade http://www.alphatrade.com

Contact management for phones

BLUE BELL Penn (NB)—Phone.com the firm formerly known as Unwired Planet, has announced that a third-party company, Practical Sales Tools Inc has developed a contact manager application for its UP.Browser microbrowser for smart phones

Phone.com's microbrowser technology has been designed as a low graphics facility for accessing Web based or intranet data across a mobile phone link.

Because the microbrowser is built into the phone, and displays on the phone's screen, it allows the phone to interact with the cellular network and retrieve, as well as view hypertext-based data.

The idea behind the PC-based contact manager, known as UnwiredContact, is that users of microbrowser-equipped mobiles can edit, create, and generally interact with a contact database in their office even when they are miles away.

According to Cindy Dahm, director of alliances with Phone.com, UnwiredContact is unusual in not requiring users to synchronize their mobile database with the host database—instead, users view a window on the database using the phone's microbrowser. UnwiredContact is a server-based application that the firm says allows handheld devices to serve as true thin clients that can directly access and modify information in Symantec's ACT and SalesLogix sales information system databases stored on company Web servers.

UnwiredContact runs on a Windows NT Web server with IIS 3/4 or Netscape Server—a permanent connection to the Internet or VPN (virtual private network) is required. The software sells for US$4,995 for the server edition and US$195 per user licence.

Practical Sales http://www.practical-sales.com

Presentation hardware gets lighter and brighter

By Ross MacDonald

Presentation equipment manufacturers continue to produce new, more refined and much simpler to use devices, while maintaining traditional price points This has resulted in more businesses and individuals taking advantage of this once elite equipment

What follows is a rudimentary guide to the technologies you might encounter while shopping for presentation hardware

LCD overhead panels

This projection technology is definitely dead according to Feizal Faroo sales manager at Sharp's Audio Visual Ltd. "Nobody's making them any more but, if somebody really wants one they can be found after some difficulty." Thus they are briefly included here.

LCD (liquid crystal display) screens are the same as those found on notebook computers and comprise a compound of complex molecules sandwiched between two layers of glass or plastic. These molecules behave like crystals even though they form a liquid. They move and twist to block light or let it through according to electric charges sent from the edge of the screen

But LCDs don't create "active" light which is why portable computers need a backlighting system The bulb in an overhead projector serves the same function for the transparent LCD panel when you're making your presentation.

If you really want an LCD overhead panel the price remains in the $900 to $1,500 range—if you can find one But the main reason they are no longer made is that they offer poor image quality by current standards and limited brightness from the adjunct overhead projector. Overhead projectors were designed to shine light only through a thin transparency sheet Brightness is lost when that same light is broadcast through the two sheets of glass and liquid layer of an LCD panel. Another downside to LCD panels, is that you have to count on an overhead projector being available for your presentation

Which is why self-contained projectors have for the most part replaced LCD overhead panels.

LCD projectors

LCD projectors come in two basic flavors an economical single-panel and a more expensive three-panel configuration. Single panel projectors work on the same principle as an LCD overhead panel but with a built-in overhead projector. Inside the device is a tiny LCD panel (9x1 3 in) on which the computer-generated image is created before being projected through a magnifying lens by a powerful lamp The three-panel type works much the same way, but has individual panels for the creation of each primary color (red blue and green), which are combined into a single image by mirrors before being projected by the lamp and lens.

LCD projectors have the advantage of being small, light and self-contained while producing sharper, clearer, colorful images Of course three-panel LCDs produce better results on all counts Price-wise single-panel models cost between $2,500 and $2,900 while three-panel projectors will start at around $3 900

Just entering the market is an incarnation of this technology called reflective LCD, which projects the image onto a reflective chipset then through an LCD panel to add color before being projected out of the lens The result is a high quality image from a small and light machine, which has the potential to be manufactured on a standard production line

"The real benefit [to producing LCD reflective projectors in this way] is that there will be lots of competing vendors because a feature-rich device will end up being a fraction of the cost of a current device," says Ben Joy, senior product marketing manager for InFocus Systems "Single-panel LCD stuff is basically dead because they simply don't perform well enough for today's consumer demands, while three-panel LCD is at its pinnacle right now—though it's hard to get that technology into a machine under 10 lb [4 5 kg] Reflective LCD will eventually

Continued on page **114**

Avoiding presentation gotchas

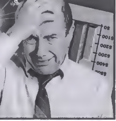
Tips from a presentation disaster veteran

By Geof Wheelwright

It will be alright on the night That's the time-honored phrase used to describe the hopes held by those of us who venture forth to perform in front of others. Whatever your fears, anxieties and misgivings about the performance you have to give no matter how many times you have blown your lines in a rehearsal these seven words keep you going.

And that may be OK if you are a professional actor, where a small measure of pre-performance jitters can be channeled into positive nervous energy that yields a vibrant and captivating portrayal But for those who have to "perform" daily during formal business presentations, this notion just doesn't cut it

In fact, the rehearsal for a big presentation—walking through the whole shebang for the benefit of your boss and co workers—can be even more important than the final presentation to customers Customers may be willing to forgive a flubbed line or a missed cue, but your own senior executives could take a different attitude



Leaving aside those considerations, one of the biggest challenges you can face during a business presentation may have nothing to do with your own abilities as an engaging public speaker—it lies in the technology you use to support your presentation

In many cases, that technology is a portable LCD projector, a mobile computer, and a presentation prepared in Microsoft PowerPoint Corel Presentations or Lotus Freelance Graphics The projector is plugged into the computer and pointed at a screen (or blank wall) and the professional presentation begins Or at least that's the idea.

The biggest challenge you may face during a business presentation could have nothing to do with your own abilities as an engaging public speaker

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Presentation hardware gets lighter

Continued from page ***112***

yield a feature-rich device that is smaller and lighter for about the same price as a basic three-panel projector."

DLP projectors

Another new alternative—the DLP projector—employs a completely different technology. DLP (digital light processing) projectors are based on a digital micromirror device (DMD) chip developed by Texas Instruments.

This chip is covered by millions of micromirrors, which each represent an image pixel. To form the image, the mirrors turn a certain way to reflect or deflect light as instructed by the computer. The advantage of this technology is that, being reflective, the image is usually brighter while, being chip based, it is smaller and lighter than a three-panel LCD technology. However, the entry level price for a DLP unit is about $5 500.

James Chan, product manager for flat-panel and presentation systems for ViewSonic Corporation has a clear preference for three-panel LCD projectors, which he says have better color reproduction then DLP. The latter's reflective nature causes some loss of color saturation. Feizal Paroo agrees.

But Ben Joy of InFocus—an industry leader in DLP projections systems—suggests the color saturation of LCD projectors (which the company also produces) is "cartoon like" because it's overdriven. "That's not a bad thing if you're doing computer graphics," he says. "But it is a bad thing if you're presenting film."

Brightness matters

"What we chose as an industry is that lumens are more important than cartoon like color saturation. We're in a race for lumens in our industry," Joy says.

Different companies describe the brightness of their projectors in different ways but a good tip is that brightness should be expressed in units called ANSI lumens. The higher the ANSI lumen number is, the brighter the image will be in larger and/or more brightly lit rooms.

Though it's a measure that's difficult to imagine without visual examples, it's fair to say that 400 ANSI lumens is adequate for a normally lit conference room with a seating capacity of up to 12 people. A classroom situation might require 600 ANSI lumens. A large ballroom-sized conference room might require a projector capable of 1,000 ANSI lumens or more. The technology is now approaching 2,000 ANSI lumens.

However, Paroo warns that two projectors touting the same ANSI lumen value will not necessarily provide the same brightness or picture quality because a lot depends on the optical design of the projector. "There is a genuine difference in brightness and quality between brands even when they might have the same specifications on paper," he explains. "Brightness on paper doesn't necessarily equal brightness in the real-life situation. Customers shouldn't just shop based on brochures because a lot of times manufacturers overestimate the brightness of their projectors. They know the consumer isn't actually going to measure it. Other companies are more conservative and list a value closer to the genuine brightness. It is best to insist on a demonstration."

But, where it might seem logical to simply go for the brightest possible projector, size, weight and especially cost are all affected as these factors are maximized. That means it is best to determine which projector type best suits your needs and then budget for the brightest available in that range.

Other shopping tips

There are many other things to consider when buying a projector starting with resolution. Determine if a projector is capable of SVGA [600x800] or XGA [1,024x768] resolution and which resolution you require. SVGA is sufficient for use with an older model laptop computer because most are only capable of this resolution anyway.

Interestingly most SVGA projectors can perform a compression routine to reproduce 1,024x768 resolution and a lot of presentation software is resolution independent so when you go into slideshow mode the slides are full screen regardless of the resolution setting. But resolution makes a big difference in price. An SVGA projector can run anywhere from $2,000 to $6 000. XGA projectors will list anywhere from $10,000 and up!

"Many customers are now upgrading from the SVGA to XGA projectors because they've upgraded their laptops to those higher resolutions too," according to Paroo.

"The reason you don't want to run the high-res compression routine on an SVGA laptop is that you have to turn the screen of the laptop off so you can't use it as a reference," says Paroo. "A lot of presenters need to use the laptop's screen as a reference—it's like a lifeline—so they'll spend the extra money to get the capability of high res projection with simultaneous high-res monitoring."

The next important factor in buying a projector is the type of presentation environment you're working in and how much control you have over it. Calculating the required number of ANSI lumens is easy if you're going to be making all your presentations in the same environment. But for those taking their show on the road, balancing brightness against cost, size and weight is a more complex equation. However, 600 ANSI lumens is considered plenty for most business presentation environments.

The weight of a projector is another serious consideration, especially if you plan to mount it on a wall or ceiling, or travel with it. If doing the latter, the frequency and mode of travel should also be considered when deciding how much you are willing to tote around.

Projectors fall into three weight classes: ultraportable, which is less than 4 kg (8.8 lb.), portable, which is between 4 and 7 kg (8.8 to 15.4 lb.) and desktop projector, which is anything greater than 7 kg (15.4 lb.). Some desktop projector heavyweights tip the scales at 15 kg (32 lb.).

"Sizes have gotten smaller in the past year," says Paroo. "The sub-10 lb. [sub-4.5 kg] category is where the most advancements have been made in terms of yielding higher quality output but in that lighter weight class."

InFocus has taken such advancements to the extreme with its new LT-330 Dragonfly DLP projector, which has XGA capabilities and casts 650 ANSI lumens. At 2.2 kg (4.9 lb.), this machine will be the smallest (2.5x8.75x9.75 in.) and lightest available (it is due for release in June). Joy says recent improvements in DLP technology and lamp and bulb design (which reduce heat and power requirements) have made it possible to put all this power in such a small package. Unfortunately its estimated price—US$7,000—is not nearly as diminutive.

Brightness tip

What you are projecting your images onto can make a big difference in the final brightness of your images. A 600 ANSI lumen projector will look very good even on the average white wall. But Paroo says a new product, Instant Theatre, can maximize the impact of your projections. Instant Theatre is a small mylar screen packaged in a tube with telescopic legs, like home-movie screens of yore. But at 1.35 kg (3 lb.) Instant Theatre is much lighter and more portable.

Large screen monitors

Another presentation medium is the large-screen monitor—which can be based on cathode ray tube (CRT), LCD or gas plasma technologies. CRTs are, of course, the standard TV-like monitors we've all lived with for years—they're just making them bigger these days. LCD versions are only now entering the large-screen category because recent improvements in the manufacturing process have made bigger panels more affordable.

Because of the developments in projector technology, monitors are gradually being being phased out for use in presentations. Gas plasma monitors, however, are the exception. Despite the high cost of this technology, there is growing interest in using these displays for presentation purposes.

Gas plasma begins with a sheet of glass onto which a fine grid of raised ribs is applied, according to an NEC release. A coating of red, green and blue phosphor material is deposited into the spaces on the grid. Each set of three adjacent cells, one of each color, constitutes a pixel. A second glass plate is placed on top of the assembly, trapping a gas—helium, neon or xenon—inside. Electrodes are embedded in the glass plates.

Selectively applying voltages to the electrodes causes the gas inside to discharge ultraviolet light, which in turn causes the phosphor to fluoresce, sending colored light out to the viewer. The individual cell structure and selective voltage technology enable the plasma display to produce even illumination and exceptional image quality at large screen sizes.

The key difference between LCD and this technology is that gas plasma actually emits light while LCD requires backlighting to broadcast images.

The image produced by gas plasma is exceptional—as is the price. A large (20 inch) LCD might cost a few thousand dollars while a similar size gas plasma panel bears the same price tag as many a new car ($15,000 or more). As with LCD monitors, gas plasma monitors can stand alone or be hung on the wall like a painting, which is an advantage where space is at a premium.

Regardless of which monitor technology you are interested in, they are all too cumbersome to cart around so are best suited to a permanent presentation environment. ❑

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Avoiding presentation gotchas

Continued from page **113**

As an audience member at hundreds of such computer-driven presentations (and creator of a few), I can tell you that it doesn't always work out that way.

Software pitfalls

To start with, there is no guarantee that you have the inherent talent to create a compelling presentation with the software packages mentioned above. While they all include excellent templates for basic presentations, chances are that veterans of such presentations will have seen most of them.

The real trick is to restrain yourself from using too many slides—or going overboard with the jazzy colors, clipart and so on. As with any attempt at seasoning, selective use of the strongest spicy elements seems to be the key to tasty results.

Another great hurdle lies in knowing how to create a presentation that uses the technology to best advantage. Ideally your onscreen presentation should add to what you are saying, not be a verbatim transcript of it. Unless you have an audience of preschool children, they are unlikely to be captivated by the sight of you reading something from the slide. The text, graphics and video the audience sees should complement what you are saying—and reinforce your key points—not merely repeat it.

Presenters can also get a false sense of their abilities when preparing slides. Because text can be added to slides so quickly and easily they are often created on a whim—without a careful review of the completed product. The resulting spelling mistakes, grammatical

Continued on page **118**

Presentation tips

Overall, you should be looking for a software package containing all the tools you need to organize, illustrate, and professionally deliver your ideas. The package you select should also be very easy to use because you want to focus on the presentation, not on figuring out how to use the software. It should also be flexible enough that you can shuffle your material around while keeping it organized in case you want to make several different presentations using common materials.

Software buying tips

- Make sure that in "slide show" mode, your presentation software will produce full-screen images regardless of resolution.
- Look for packages that allow you to save your files as HTML documents. This means you can store your presentation on the Internet, then tap into the site with your computer and projector from wherever you are. Or, even better, others can view your presentation on the Net with their own computers.
- Make sure your selection integrates with other packages (or at least recognizes a wide variety of file formats) so you can import outside materials.
- A software package with lots of templates gets you going quickly.
- Another feature available in some software is separate audience and presenter views. This allows you to add notes and reminders to your presentation that are not visible to the audience.

Tips for effective presentations

- Don't put too much information on a single screen. Keep text and graphics simple and limit yourself to four or five points per page.
- Use large fonts and typefaces, and large, easy-to-read graphics.
- While your package may include lots of options for backgrounds and transitions, don't use too many in an attempt to dazzle your audience. There's room for some variety in order to better engage your audience—you don't have to use the same background and transition through the whole show, for example—but exercise some restraint.
- Don't underestimate the impact the overall look (background, color scheme, effects, etc.) has on the effectiveness of your presentation. Compelling information poorly presented will not make as much of an impression as compelling information compellingly presented.
- Timing your presentation is very important. Some software incorporates a feature that allows you to practice this, but you should rehearse your timing even if your package does not have such a feature.

—Ross MacDonald

Thanks to Faisal Parco of Sharp's Audio Visual Ltd., James Chan of ViewSonic Corp., Anne McInnis of Microsoft, Mia Angart of inMedia Presentations and Lance Bailey of NEC Technologies Canada, who supplied these tips.

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Small changes add big value to CE

The time has come to re-assess Microsoft Windows CE. Over the past three years I have had a love/hate relationship with Microsoft's flagship mobile and embedded systems computer operating system. I loved the fact that it encouraged manufacturers to produce mobile systems that were more powerful and more flexible than anything that had gone before

ON THE GO

GEOF WHEELWRIGHT

Color screens, built-in modems CompactFlash technology built-in Web-browsing and email software all piqued my interest in CE based systems but limited battery life "cut-down" versions of Microsoft Office applications and the lack of wide spread third party software support kept me from becoming too interested.

> Every time I switched the machine off then on again, it would reliably return to where I left off, without me having to wait more than a split second

But with the recent release of systems based on the latest Windows CE Handheld PC Edition Version 3 I am once again re-examining my thoughts on the future of CE. To help me formulate those thoughts I recently took delivery of an NEC MobilePro 800—a Windows CE-based "sub-notebook" with a 9.4-inch color display and SVGA (800x600) resolution, an internal 56Kbps modem, battery life of eight hours or better, 32 MB of RAM and external ports to connect USB (universal serial bus) devices as well as an external VGA display

While all of those features were great, the real difference from my previous encounters with Windows CE systems lay in the stability of the applications, and the breadth of their abilities The MobilePro comes with Pocket versions of Word, Excel, Outlook, Access and PowerPoint

None of these applications offer anything like the number of features provided by their desktop counterparts but they are a lot better than earlier implementations. Pocket Word, for example now comes with built-in spell-checking, document outlining and multiple levels of "undo." If Microsoft would only put a "word-count" feature (an essential feature for all freelance writers), the basic feature set of this product would feel complete.

The overall interface offered in Windows CE is also a lot better than anything I have seen before with Windows 98-style file-handling and Internet Explorer 4.0-style functionality built into the Pocket Internet Explorer browser NEC also makes the whole interface more usable by providing a great keyboard and a really good-looking screen in a package that is lightweight, yet seems sturdy and well-built

This is not to say, of course that NEC got everything right with the MobilePro 800 Like Hewlett Packard's recently released Jornada, NEC put the on-off switch immediately beside the backspace button so it is possible to accidentally switch the machine off when you are editing Admittedly, the power button is recessed so that the chances of this mistake occuring are much slimmer than ➤

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with the Jornada, which I was constantly switching off by mistake.

But that leads me to what is probably the best part about the recent crop of Windows CE machines—the ability to switch them on and off at will without losing data. Not once during my test of the MobilePro did I have to reach for the "re-set" button. And every time I switched the machine off then on again, it would reliably return to where I left off without me having to wait more than a split second.

This is a huge contrast to my notebook computer, which can take several minutes to start from a "cold boot" and is often a bit flaky when I use the built-in "resume" mode.

With this latest generation of Windows CE machines, it was also very useful to be able to swap CompactFlash memory cartridges, allowing me to use a single cartridge to store files from three different mobile computers (the MobilePro, the Jornada and a Psion Series 5) along with Epson's PhotoPC 700 and PhotoPC 750z digital cameras.

Support for this memory standard also meant I didn't have to install multiple data transfer applications on my desktop computer to store files from the digital cameras, the handheld computers or the MobilePro. In fact, I was able to use the simple file transfer utility that came with my Psion Series 5 to copy files to and from the desktop. I merely inserted the CompactFlash card into the Psion, moved whatever was on the card to the desktop via the Series 5, then erased the data on the card. I could then insert it in the MobilePro, the Jornada, or the digital cameras to store data from any of those devices.

At any rate, I hope to be able to report more on my adventures with the MobilePro and other new Windows CE devices in the near future as I believe this technology may finally be "ready for prime time." ❑

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Avoiding presentation gotchas

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errors and misplaced graphics then shine down on an audience of hundreds of people.

In an effort to help out at a presentation about a planned construction project, I once made this very mistake. In one slide, we were due to have a number of architectural drawings that showed off the new building. The only problem was, that when we got to that slide, PowerPoint was having real problems displaying the graphic.

In a desperate attempt to get the graphic on the screen, I opened up the raw data file in Microsoft Photo Editor only to find that the drawing was sideways. As the architect nervously worked through the prepared text that was to introduce this slide, I furiously tried to use the rotation tool in Photo Editor to get the drawing moved by 90 degrees. A slow processor and limited hard disk space on the notebook computer, however, prevented that from happening. I eventually stopped the rotation and, just as I was scrambling to try it again, the architect got to the part of his presentation in which he needed the slide. So I did the only thing I could. I switched on the projector, projected the sideways image and then picked up the projector, turned it on its side (to hoots of laughter from the audience) and displayed the image.

I would not recommend this strategy to anyone, but it illustrates the need for preparation and rehearsal.

Notebook notes

Another thing to keep in mind is that you will likely be giving your presentation using a notebook computer. Notebook computers are wonderful things, but they have several unique features that you have to be aware of when doing a presentation. Probably the most important of these is the fact that notebooks are designed to maximize battery life. That means they will try to go into some form of suspend mode if you don't touch the keyboard for a specified period of time (such as the minute or two that it takes you to talk through a given slide). With some LCD projectors, the link between the projector and the notebook can disappear if this happens, and you may have to hit several keys in order to re-establish it. The long and short of this is that you should disable all power-management functions during a presentation.

One other thing you need to be careful about is your screen saver. If you have a screen saver running on your notebook computer—particularly one that might embarrass you if seen by hundreds of people—switch it off during your presentation. Again, this is because the screen saver could come on if the keyboard hasn't been touched for a minute or two.

As with the power management functions, you could also set a longer delay period—say an hour—for the screen saver so you wouldn't have to switch it off during the presentation.

These are just a few of the technological issues to consider when preparing a computer-powered presentation. Good luck! ❑

NetWare's small business suite

LAN LINE

ISSIE RABINOVITCH

In the June issue of *TCP*, I described NetWare for Small Business 4.2—a version of NetWare 4.2 optimized for a single-site small office (50 or fewer users) that is bundled with a suite of Novell and third-party server-based applications.

I attended the launch of this product at Fall Comdex '98 in Las Vegas in November. Since NetWare 5.0 had already shipped in September the obvious question for the Novell presenters at Comdex was "Why base the Small Business package on NetWare 4.2, and not the latest version?" There were several reasons given but the most plausible seemed to be that, because of the integration work and testing required it was too early to release a version of the suite based on NetWare 5.0. We were told to expect it sometime in 1999. While writing this column I was notified that Novell Small Business Suite 5.0 had entered beta testing, so it is reasonable to expect a version to ship by the end of the summer.

Replacing NetWare 4.2 with 5.0 is not the only change in the Small Business suite. An interesting, and perhaps most significant, change is in the name—replacing NetWare with Novell. Other changes include the upgrading (or just altering, depending on your point of view) of several applications in the suite. Novell didn't include details on price or upgrade programs, but they will be available at the Novell Web site (http://www.novell.com) when announced.

> Creating NetWare Loadable Modules (NLMs) to run on NetWare is a much more difficult programming feat than creating a program with similar features to run on Windows NT Server

NetWare vs Windows NT

One of the major differences between NetWare and Windows NT is that the latter offers a much better choice of server-based applications. Creating NetWare Loadable Modules (NLMs) to run on NetWare is a more difficult programming feat than creating a program with similar features to run on Windows NT Server.

Novell has decided that the long-term solution for this problem is to support Java applications on NetWare 5.0. At some point in the future, there may be a good choice of such applications, but for now, if your needs are not met by the applications in NetWare for Small Business 4.2, you must add an application server to your LAN. Depending on the server-based applications you need, that would mean running Windows NT, Linux, or some version of Unix. All of these platforms present more applications than NetWare. Only offices that want to get by with a single server, or that don't want the complexity of supporting two server operating systems, are deterred by this option.

Fortunately, the applications in NetWare for Small Business 4.2 are excellent. For most offices the key server-based application is email. GroupWise 5.2 is an excellent communications and collaboration package supplying much more than just email. It doesn't have the high-end development capabilities that have made Lotus Notes so popular in some environments, but it can be described as groupware without abusing that term.

GroupWise works best with a dedicated Internet connection. That represents a higher monthly cost than many offices are prepared to pay. An Internet service provider (ISP) that supports ETRN (a type of SMTP command) is needed for a dial-up connection, but many ISPs are adamant about not supporting it.

Netcom Canada, one of the major ISPs serving the corporate market, provided me with a paper entitled *The Danger of ETRN* to explain why it doesn't support it. It describes ETRN as "an attempt to address the inability of the SMTP protocol to function between dial-up connections between two SMTP servers." It goes on to point out the performance and security "headaches" associated with ETRN.

This is one side of the story, to be sure, but I think it's wise to consider how you would implement GroupWise before committing to it.

Excellent integration

NetWare for Small Business 4.2 is an excellent, integrated package that meets the IT requirements of most businesses with fewer than 50 computers. If your operation is sufficiently sophisticated that you require functionality not included in this suite, you should have no problem adding an application server to your NetWare LAN to run the application of your choice.

I'll write more about NetWare once I have tried out Small Business Suite 5.0, but for now, I'd like to offer a few technical tips that may be useful for offices using NetWare.

One of the reasons for NetWare's speedy performance is the way it uses RAM for caching. Without sufficient RAM, two different kinds of problems can arise. NetWare's performance declines dramatically, and worse, it can become unstable. Versions of NetWare prior to NetWare 5.0 cannot use virtual memory when memory requirements exceed physical memory. Thus, it is important to populate a NetWare server with sufficient RAM.

Novell provides formulas for calculating the amount of RAM a NetWare server requires, but they are inaccurate. The best approach is to enter the command Load Monitor on the console of the server and examine some statistics. Choose Resource Utilization then Cache Buffers and if it is less than 20 percent, add RAM. Choose Cache Utilization, then Long Term Cache Hits, and if below 90 percent, add RAM. Choose Cache Utilization and if too many dirty blocks increase rapidly while you're monitoring add RAM.

Adding a new hard disk is a common source of RAM requirement problems. After all, one of the parameters that influences RAM requirements is the size of disk space being cached.

It can be tempting to add RAM and a new hard disk at the same time. But, while seemingly the most efficient approach, it is fraught with danger. This is because NetWare is more demanding of RAM than other operating systems. Just because your new RAM passes the computer's power-on self-test doesn't mean it's good. It can still cause problems in NetWare.

Unfortunately, NetWare doesn't give clear error messages if there's a problem with the RAM. Error messages are generated but they can be difficult to associate with faulty RAM. In fact the most common error messages are consistent with a disk problem. So to isolate potential conflicts you shouldn't do the two upgrades at the same time. Do one upgrade, then if the server runs successfully for a few days, do the other. ❑

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The Visual Basic tutorials: Part 1

Getting to know the basic canvas

By Jacques Surveyer

As promised in our review of Java and Visual Basic in the last issue of TCP (see "Java and Visual Basic: programming's new breed"), we are commencing a series of tutorials on Visual Basic (VB) this month.

The tutorials will be geared to an intermediate level of programming knowledge. Thus, we assume the reader has programmed in at least one procedural language—C, Fortran, Pascal, or Javascript, but not HTML (HTML is a tag language and does not have flow of control commands like For or If-Then). We also assume readers are reasonably comfortable working in Windows with a browser, in Word, Lotus 123, or other applications with a full set of GUI (graphical user interface) features.

In order to accommodate both beginning and advanced VB users, we have provided a reading list of books. In addition, we will suggest additional reading in each tutorial from two of those books: Peter Wright's *Beginning Visual Basic 6* for beginning users and *Visual Basic 6 Black Book* for advanced users. Now, without further ado, welcome to Visual Basic.

As we have pointed out in the introduction to these tutorials, VB and its follow up, Visual Basic for Applications (abbreviated as VBA, which is the scripting language for Microsoft Office Suite and about 100 other major Windows applications) pioneered and refined visual programming. Visual programming means you "paint" the look and feel of your program, then tie together the forms, controls and overall processing with code and procedural code.

The task of making the visual parts of the program function as an effective whole is expedited by the use of templates, wizards and design tools within the VB IDE (Interactive Development Environ). This is your visual development "canvas."

Figure 1 shows the VB canvas. This is where you will be working both in VB and VBA a good percentage of the time. So it is worth getting to know its five basic elements very well. As we'll see when we cover Java in future tutorials, this style/usage of multiple windows (which Microsoft calls Multiple Document Interface, or MDI) is a very popular IDE. Most programming development tools have copied this layout to some degree, so learning it well will pay off.

Every time you load a VB or VBA project, you will be greeted by a layout that is roughly the same as that of Figure 1.

1. The toolbox

The first of the five basic elements is the toolbox. It contains all the GUI elements/controls needed to create any VB form and the front end to all VB programs. It has 20 of the standard controls used frequently in VB programs, including the Pointer Tool, Image Control, Label, Textbox, Frame and Command button. These basic controls fill about 60 to 90 percent of your programming needs and are automatically included in the VB runtime. While it is possible to add many other Microsoft-supplied or third-party ActiveX components/controls to this toolbox (including controls you have built), these extra components can add significantly to your program's final runtime. We will discuss these issues in detail in a future tutorial.

2. The form

The second basic element is the form. You can size it, color it, give it a caption and fill the form with GUI controls that help your program do required tasks. Putting controls on your form is as easy as clicking on the control (say the Command button) in the toolbox, then dragging and sizing it on your form (see the Exit button on the form).

3. Menus and toolbars

The third element is comprised of the menus

Continued on page **122**

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Getting to know the basic canvas

Continued from page 120

and toolbars that manage and control all of VB/VBA. VB has sprouted like a weed in the past three years, so there are lots of commands and operations to learn. We will try to highlight the most important ones in our tutorials

Most readers, however, will already be familiar with many of the menus and icons. FILE, EDIT, VIEW, RUN, WINDOW, HELP menus should be familiar to any WordPerfect Excel, or Netscape users In our example icons for FILE OPEN, FILE SAVE, CUT, COPY, PASTE, FIND, RUN PROGRAMS, PAUSE PROGRAM, HALT PROGRAM can be seen along the toolbar Along with built in wizards and custom command centres in some controls, these are the heart of VB

4. Project Explorer

The Project Explorer helps you access all the forms and coding files in your VB program. It is such a handy navigation device that you will find yourself using it all the time to switch among different forms and code Even in small- to medium-sized programs multiple forms are common and easy to create The Project Explorer is so important we devote a full tutorial to it and the text editor.

5. Properties sheet

Even more useful than the Project Explorer is the Properties sheet. Note that the Exit command button in our example is highlighted in the form and in the Properties sheet The Properties sheet is both the blessing and the curse of VB.

If you want to change a property of a control—its COLOR, SHAPE, or CAPTION, for example—this is the place to do it However, a command button has 32 properties, and some controls have hundreds—hence the curse Fortunately, about 80 percent of operations can be done with the following six properties on a command button APPEARANCE, CAPTION, ENABLED, TOOLTIP, TABINDEX, and VISIBLE.

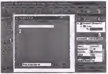
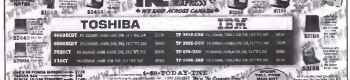


Figure 1: Five elements of the basic canvas.
1) Toolbox of controls. 2) Form with controls added 3) Toolbar 4) Project Explorer. 5) Properties sheet.

The trick is getting to know the most useful properties, controls and overall commands quickly But as detailed in our introductory Java and VB article in the June issue,

Continued on page 124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Coming Up

in the August issue

- Scaling the heights of new media
- Monitors
- Backup and storage

Master your documents

By Helen Bradley

In response to reader requests, this month we'll look at the benefits of using your word processor's master document function when preparing large documents.

A master document allows you to manage a large project as a series of smaller documents. Each of the smaller or subdocuments can be edited separately, then brought together for final printing. Or, you can edit all the documents by opening and expanding the master document. This allows you, for example, to move text from one subdocument to another.

I'll discuss master documents in Microsoft Word 97. These features work similarly (but not exactly the same) in other versions of Word. I've also included some brief starter notes for master documents functions in Corel WordPerfect and Lotus Word Pro.

One of the benefits of using master documents in Word is that the styles in each subdocument will be "overridden" by the styles in the master document. So provided you use the same style names in all your subdocuments, the formatting will be consistent within the master document when it is assembled and printed. You can also format the master so page numbers flow correctly through the subdocuments correctly, and cross references and footnotes are automatically updated within the master document.

Proviso

While Word 97 overcomes many of the master document problems found in earlier versions of the word processor, it's by no means faultless. There is an extensive troubleshooting section in Word 97 Help devoted to master documents.

Microsoft Knowledge Base also has an excellent summary article that contains much of the information from Word Help. Microsoft will send it to you (as it will any Knowledge Base article) if you send an email to mshelp@microsoft.com that includes the article number (Q180142) in the subject line.

Another article (Q164458) covers the issue of corrupt master documents and contains a link to a utility (mdocutil.exe) to fix them. You can download it from http://support.microsoft.com/support/downloads/LNP152.asp

Creating a master document

You can create a master document from scratch or by assembling a range of existing documents. To do this, you'll use Word's Master Document view and a process which is similar to Word's Outlining function.

To start a Master Document, create a new document and select View, Master Document and type the following text using these styles, which you can select from the Style dropdown list on the Formatting toolbar:

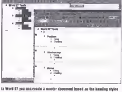
Text	Format as this style:
Word 97 tools	Heading 1
Toolbars	Heading 2
Using	Heading 3
Creating	Heading 3
Shortcut Keys	Heading 2
Using	Heading 3
Creating	Heading 3
Menus	Heading 2
Using	Heading 3
Creating	Heading 3

The choice of styles is critical to the process. Heading 1 is the title of the master document and Heading 2 will be the starting point for every subdocument that will be created. Heading 3 is the heading style for subheadings within the subdocument.

When you are creating your own master documents, stick to using these headings for these purposes. So, there should only be one Heading 1 in your document, and each Heading 2 will become the beginning of a new subdocument. Lower level headings will be subheadings in the subdocuments.

Remember that you can always change the heading styles so you're not stuck with their default appearance. Styles should be changed in the master document so they will override any style definitions in subdocuments.

Select all the text from (and including) Toolbars to the end of the document and select the Create Subdocument button on the Master Document toolbar. Word uses the style of the first line of text you have highlighted as the style to begin each subdocument. Because you selected the word Toolbar first and its style is Heading 2, a new subdocument will be created whenever Word encounters a piece of text formatted with the Heading 2 style.



In Word 97 you can create a master document based on the heading styles used in a document outline

You'll see each subdocument in the master document screen surrounded by a box. In the top left corner of the box is the subdocument icon.

Saving your documents

When you save your master document all the subdocuments are automatically saved in separate files at the same time. Word also names each subdocument using the first few words from the subdocument. For ease of working, you should save a master document (and, consequently, its subdocuments) in a separate folder. To do this select File, Save and locate the folder to use or select the Create New Folder button. Give your master document a name and click Save.

Now select File, Close to close your file. To see how Word displays your master document as a title with hyperlinks to each subdocument, select File, then Open. Notice that the title is the only text that appears in the master document—all the other text is contained in the subdocuments.

To open a subdocument click on the hyperlink and the file will open in a separate window for editing. You also have the option of opening the contents of subdocuments within the master document by switching to the master document and selecting the Expand Subdocuments button.

Sharing the work

One benefit of using master documents is that you can share the work on a project with other people. Each subdocument can be opened as you would any other document by selecting File, Open and locating the file name and clicking Open.

Other people in your office, or elsewhere, can open and edit a subdocument without needing access to the other subdocuments or the master document.

You'll probably find, even if you're the only person working on a document, that it is easier to open a single subdocument that requires editing than it is to open the master document.

You will need to use the master document, however, when moving or copying data from one document to another. To do this, open the master document and select the Expand Subdocuments button to see the document contents. You can then copy or move text as you would in any regular Word document.

When you're working on a master document with the subdocuments expanded, you may prefer to switch to another view such as Normal view (select View, then Normal) to work on the document. This is a more familiar environment than the Master Document view for most people.

Other options

Often you'll want to add a subdocument to a master document. To do this, open the master document and select the Expand Subdocuments button. Put your cursor in the place you want the new subdocument to appear (this should be between subdocuments not within one) and click the Insert Subdocument button. Locate the file to insert and click OK.

You can remove a subdocument from the master document by first selecting the Expand Subdocuments button, then select the subdocument's icon and select the Remove Subdocument button. This removes the subdocument and moves the text it contained into the master document. If you want to delete the subdocument, select the subdocument icon and press the Delete key.

Similarly you can move a subdocument by clicking and dragging its Subdocument icon to the new position in the master document.

You can easily create indexes and tables of contents from your master document by opening it and selecting the Expand Subdocuments button. To create a table of contents, for example, position your cursor where the table of contents is to appear and select Insert, Index and Tables and select the Table of Contents tab. Select a style from the list and click OK to create the table.

If you view your master document in Master Document view and select the Show/Hide ¶ button on the Standard toolbar you'll see the section breaks that appear between subdocuments. You can use this view to control the final layout of your document. A section break labeled Continuous means the text following the section break will appear immediately after the break. A section break labeled New Page means the text following the break will start on a new page.

You can alter a section break by opening the master document and select Expand Subdocuments. Move the insertion point so it appears immediately after the desired section break and select File, Page Setup, and select the Layout tab. From the Section Start dropdown list select the type of section break you want. From the Apply To dropdown list select This Section and click OK. You can choose Continuous or New Page as well as specifying that text following a section break appear on an odd or even page.

Be careful if you rename or move a subdocument. Unless you do this from within the master document, Word won't know where the document has been moved to and it won't be able to find the document when you next open the master document. If you need to rename or move a subdocument, open the master document and click on the subdocument you want to rename to open it in its own window. Select File, Save As and give the file a new name or save it to a different folder (or both). Once you've done this, you can switch to the master document and close it (make sure you save the subdocument first, however).

Printing options

As a rule of thumb if you select Print when your master document is open you'll print out a copy of what is currently visible on your computer screen. For example, if the subdocuments are collapsed and only the hyperlinks are viewable, then only the hyperlinks will be printed.

If you select Expand Subdocuments and you can see the text from each of the subdocuments, the entire document and the styles and other options such as page numbers will print.

If you're editing a subdocument in its own window and you select Print, only that subdocument with styles and other document options specific to that document will print.

WordPerfect 8

WordPerfect uses the same terminology as Word, including master documents and subdocuments. Style definitions in the master document override those in the subdocuments. However, WordPerfect has a simpler approach to master documents and doesn't display them in Outline format, which makes them a little easier to work with ➤

You can create a master document by simply creating a regular WordPerfect file. Wherever you want to add a subdocument select File Document, Subdocument and select the document you want to create a link to and click Include. Repeat this for all documents you want to add as subdocuments.

To display the text of subdocuments in your master document select File, Document, Expand Master. Select the subdocuments to view and click OK. Collapse the subdocuments by selecting File, Document, Condense Master. You'll see a dialog with all the files listed twice—once for closing and once for saving. Select OK to save and close all the subdocuments.

To remove a subdocument you'll need to reveal the codes in the master document (View, Reveal Codes) and click and drag the subdocument's code out of the Reveal Codes window.

Lotus Word Pro 9

Master documents in Word Pro are treated a little differently than in WordPerfect and Word. Each subdocument is a separate division in the master document, and as each file uses its own SmartMaster, you can customize styles in each file. You can create indexes and tables of contents across the entire document and print with sequential page numbers.

To create a master document select Create, Master Document. Select the Add button, locate a file to add to the master document and click Open. Click OK when all the files you want to include in the master document have been added. You can also add internal divisions to your master document by selecting Create, Division. Each document will be accessible by clicking its tab. If the tabs are not visible, select View, Set View Preferences, select the Show tab, and select the Show Divider Tabs checkbox and click OK. Every time you open the master document Word Pro will open all the external files (subdocuments), and any changes you make to the master document will be reflected in the subdocuments. ❑

Next month we'll look at some typical spreadsheet problems affecting the accuracy of your work and how you can avoid them. Helen Bradley can be contacted at helen@helenbradley.com

Getting to know the basic canvas

Continued from page **122**

VB documentation has gone from bad to worse. It is fractured, out of date and/or thinly smeared over several manuals. Those manuals are only available in printed form and at considerable cost, and the examples and tutorials are either on the lean side or cost extra.

Because of the quality and pervasiveness of VB and VBA, we believe they deserve better. Hence this series. So below are a list of five book resources we have selected for beginning to advanced users.

Reading list

Visual Basic 6 in Plain English
Author: Brian Overland
Publisher: Overland, M&T Books
Price: $36
Level: Beginner to Intermediate. Good intro to a number of topics.

Beginning Visual Basic
Author: Peter Wright
Publisher: WROX
Price: $56
Level: Beginner. Makes no assumptions about reader's programming background.

Visual Basic 6 Unleashed
Author: Rob Thayer
Publisher: Sams
Price: $58
Level: Intermediate. Includes comprehensive coverage of features.

Visual Basic 6 Black Book
Author: Steven Holzner
Publisher: Coriolis
Price: $70
Level: Gradually advanced coverage of components, the Web and databases.

The Waite Group's Visual Basic 6 Database How-To
Author: The Waite Group
Publisher: Sams
Price: $67
Level: Devoted to VB database tasks.

Exercise:

Read Peter Wright's *Beginning VB6* Chapter 1 and 2 or Holzner's *VB6 Black Book* Chapter 1 and do the sample programs to get used to the VB IDE elements we introduced here. ❑

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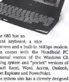
When Hewlett-Packard first asked if I wanted to have a look at its latest Jornada Windows CE-based system, I was expecting a sub-notebook size machine like the company's first Jornada systems. I was pleasantly surprised, however, to learn that the machine I would be using was considerably smaller.

HP Jornada 680
From Hewlett Packard Canada
www.canada.hp.com/cpo/computing htm
Suggested retail price $1 368

The Jornada 680 is a conventional size Windows CE handheld, measuring 18 9x9 5x3 4 cm (7 4x3 7x1 3 in) and weighing just 510 g (1 1 lb) with a standard battery that offers seven hours of operation.



The 680 has an excellent keyboard, a nice color screen and a built-in 56Kbps modem. It also comes with the Handheld PC Professional version of the Windows CE operating system and "pocket" versions of Microsoft Excel, Word, Access, Outlook, Internet Explorer and PowerPoint.

The system also has a cleverly designed expansion slot that can handle either a traditional PC Card or the newer (and smaller) CompactFlash media, making it easy to swap data with digital cameras and notebook computers.

But despite its exquisite design and excellent specifications, it is not perfect. I would like to know for example which bright spark on the HP design team figured that it would be a smart idea to put the backspace key beside the power-on/off button During my test, I often found myself mistakenly switching the machine off as I went to backspace over some erroneous text You have to wonder how such an obvious mistake could creep into an otherwise quite spectacular little machine

At any rate it is really little more than a quibble When you consider all the features HP has built into this machine, you will probably find it easy enough to learn how to avoid the off button.

With a suggested price of nearly $1,400, this handheld is as expensive as many low-end desktop systems, although not out of line with similar products from other manufacturers.

—Geof Wheelwright

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USER GROUPS

ATTENTION USER GROUPS: Send in your listing (maximum 120 characters) for the August issue by Friday July 2, 1999. Submissions runs for one month only in the local edition. *The Computer Paper* reserves the right not to print submissions which are deemed unsuitable

ACM/SIGGRAPH Computer Graphics. 2nd Tuesday, at 480 Homer St. Call Tom Berryhill at 734-3978.

AL3.2000 VANCOUVER USER GROUP: Meeting are 1st Friday of each month at Pacific Centre Mall by payphones in food court, north of Dunsmuir at Granville 4pm to 8pm. Starts early to catch the evening shift 2800ers. For more information contact Steve via email at <sage@vanbc.wimsey.com> or <sage@rainbow.deosm.com>

AMIGA USER GROUP (Panorama) For meeting times and place call Ray Norman 588-7199 or Robert Hardy 942-8864. BBS numbers 270-4561

APPLES B.C. COMPUTER SOCIETY A User Group for Macintosh and Apple IIs. Macintosh meetings are on 3rd Wednesday of each month at the York House School in Vancouver at 7 p.m. Novice and other special-interest groups are held mid-month. Apple II meetings are on 1st Monday of each month at 7 p.m. at the Century House in New Westminster. For further information and 437-9986 or 299-6687

ATARI USERS! Vanier,Vancouver, BC V6B 3Y8. 188 Sutherland 988-1456/ Don Hatch 433-6695. 2357 Western Avenue, N.Van B.C. V7M 3L4

BDI USER GROUP For more information and 532-8804 (preferred), or voice mail 532-8218

B.C. VAX/VMS Local Users Group (BCVAXLUG) provides a forum for the professional growth and education of its members through the exchange of solutions, ideas, and opinions. User group meetings are held the 3rd Wednesday of every other month at 6:30 p.m. with supper to be advised. For further info please and voicemail 276-6966

CANADIAN INTERGRAPH USERS GROUP CONFERENCE. September 8-11 1998 Delta Meadowvale, Mississauga, ON. "Drive The Open Road". Contact Laura Barrman, Intergraph, 2912 Memorial D. SE Calgary AB T2A 7R9. Voice: (403) 569-5562 Fax (403) 569-5681 e-mail: lbarrma@ingr.com

CIPS VANCOUVER SECTION (Canada's largest Association for Computer Professionals) CIPS Members enjoy unparalleled networking and professional development opportunities at our monthly meetings and special events. Discounts offered for student members. PO Box 20022, Howe St, Vancouver BC V6Z 2N8. Phone (604) 681-2798 or Fax (604) 389-1879 for next meeting date.

FOXSOFT, EDMONTON'S FOXPRO USERS GROUP-second Tuesday 7:00 pm Grant MacEwan City Centre Campus, East Wing, Room C137/C-135, 10700-104th Ave. Contact: Ken Rayner at 437-0316 or Robin Stuart at 480-3712 (days). Info Bulletin an 865 467-4185.

INDEPENDENT COMPUTER CONSULTANTS ASSOCIATION OF BC. The ICCA is a non-profit association of consultants who provide services in the field of Information Technology. The objectives of the ICCA are to provide a forum where consultants can network with each other, exchange ideas, and improve their business and computer skills. Monthly meetings with speakers. For further information contact us at PO Box 920 Bentall Station, Vancouver, BC V6C 2N6 tel: 632-2747 fax: 681-0911 email: icca@mindlink.bc.ca / WWW: http://www.icca-bc.org/icca/

LOTUS NOTES: see "Pacific Notes User Group"

MACWEST COMPUTER SOCIETY Meetings for members and visitors include PD copy sessions. General meetings: 2nd Wednesday of each month; Beginner's meetings: 3rd Wednesday of each month. 7:30 p.m. at Surrey Conference Centre. For messages and information call 298-9689.

MS ACCESS TECHNICAL USER'S GROUP For those who want to participate in learning more about MS Access. For information call Greg Hird at 464-0262, from 9:00 to 5:00.

OBJECTS USER SOCIETY See British Columbia OpenStep Group (B.C.O.G.)

OPENSTEP USER SOCIETY (VAUS) See British Columbia OpenStep Group (B.C.O.G.).

PACIFIC NOTES USER GROUP (PACNUG) Lotus Notes users meet the last Wednesday of each month, 5:15pm at Roxie's on Robson on July 31st. Contact Dolores Bauer at 986-2141 or dolores-b@wrcla.com

PC/MAC USER GROUP Wanted Professional Photography/Graphic Designers to share, network and learn the latest hardware and software programs. If you are interested please contact: R. Harrington at 874-0889 or email me at raste@istar.ca for further info

PORT COQUITLAM COMPUTER CLUB. Commodore, Amiga & IBM. 1st & 3rd Tuesday, 7:30 p.m. Room 104 George Pearkes Jr. Sec. School, 1390 Laurier Ave. Port Coquitlam. For further information contact Ed Dyer at 941-0964

POWER BUILDER. User group being formed. Meetings are planned for first Wednesday. To enroll call Perform System Developers at voice mail 604-264-0847

SQL SERVER. User group being formed. Meetings are planned for First Monday. To enroll call Perform System Developers at voice mail 604-264-0847

TI 99/4A COMPUTER B.C. 99er Users Group, every Thursday 7-10 p.m. For information, call Ron: 522-2580.

TEENS IN VANCOUVER USER GROUP For teens under the age of 18 interested in doing computer related projects regularly: WWW, programming, games, anything! The main goal is to share computer knowledge and to make friends. If there are any home-schoolers interested, that would be great. If interested, please call Orion Mak at 926-3885.

VANCOUVER AUTOCAD USERS SOCIETY 1st Wed. of the month, 7:30 p.m., B.C.I.T. Bby. Campus Bldg. SW5 Room 1850. Contact: Frank Zander (604) 582-8883.

VANCOUVER DELPHI DEVELOPERS ASSOCIATION meets once a month at the Liquor Distribution Branch, on the corner of Rupert and Broadway. The meeting is usually on the second or third Weds of the month. Please check website for details, http://www.infoserv.com/VDDA.htm. The purpose of the group is to provide a common and regular forum for Delphi developers to get together and discuss Delphi related issues. Admission is free and all notices are sent via e-mail. To have your name added to our distribution list, please send your complete contact information to vdda@infoserv.com, Fax: 604-736-5866, contact Pete Hansden at tel: 604-736-6898

VANCOUVER FOXPRO USER GROUP (VFUG). September-June, 2nd Tuesday at 1900 hours; 200-1177 W. Broadway. Info call Chris at 736-2822, 888 231-6709 and e-mail to jaytan@unisserve.com

VANCOUVER GEOWORKS USERS CLUB. For further info, please call: 683-7490 (eves).

VANCOUVER GEOGRAPHIC INFORMATION SYSTEMS USER GROUP Meetings are held on the 1st Wednesday of each month, September through May, at B.C.I.T. Town Square Room 'C' at 7:30pm. Contact:Dwight at 943-1518 for information.

VANCOUVER KAYPRO USERS GROUP-VANCOUVER PORTABLE COMPUTER CLUB

VANCOUVER NETWARE USERS GROUP (VNUG) is an official user group recognized by the Netware Users' International Assoc. and supported, in part, by Novell. Meetings are held on the third Wednesday of every month at 7 pm at PBSC Computer Training Centre Hong Kong Bank building 900-886 West Georgia Street. All aspects of the networking environment are discussed and presented with emphasis on the Netware network operating system. The workshop begins at 4:00p.m., but for dinner at 6:00pm at 7:00pm is a Q&A session followed by a presentation ending at around 8:30pm. Member, non-member and student pricing applies to the workshop and/or dinner-presentation. For further information or meeting topic announcements call our voice mail at 899-VNUG (689-8684) or Fax us at 689-8656.

VANCOUVER PC USERS SOCIETY (VPCUS) 2nd Thursday, 7pm at the Pacific Space Centre (the Vancouver Planetarium) members free and guests $5 admission. Excellent Q&A session & feature presentation. Our mission is to educate and inform our members and the general public on the current and future issues in personal computing and to provide a social context for the business, educational and personal use of microcomputers. We offer on disk newsletter,educational seminars,special interest groups (see separate VPCUS SIG listings),and more. Call 290-0690 for details and schedule

THE VANCOUVER SQL Server Users Group is an independent non-profit organization dedicated to providing an information exchange about Microsoft SQL Server. Launching its bi-monthly meetings starting Thursday January 7 1999 from 6:30pm to 8:30pm. For more information,visit our web site at www.vansql.org. Phone: 990-9434

VPCUS CLARION/TOPSPEED SIG — Clarion is a full-featured,industrial-strength DOS & Windows application development tool. Its superior high level language and re-usable templates produce compilable code and tight EXE's that run fast and are royalty free. This lively SIG attracts a range of participants from seasoned professional programmers to new users and the curious

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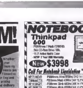

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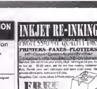

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NB—The My Century site from the BBC World Service focuses on a different aspect of this century every week, including health and people who are alive thanks to 20th century medicine. Input from users is encouraged and any of the previous features can be found in the archive

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Sony sells robot dog online

TOKYO (NB)—It looks like a dog, acts like a dog and sounds like a dog so that makes it a robot? Making history, Sony Corp has started selling the first robot designed solely for home entertainment purposes

Aibo—the name is a play on both artificial intelligence robot and the Japanese word for companion—is a four legged entertainment robot capable of walking on all fours, moving its mouth, tail, and head and learning

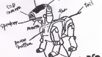
Sensors mounted on Aibo including a CCD video pickup that allows it to see enable it to behave like a living creature, react to external stimuli and act on its own judgment, says Sony

Owners will be able to operate Aibo in one of three modes The main autonomous mode sees Aibo acting like a real pet, constantly taking in what is going on around it and learning from experience The sensors allow it to react to things like touch and it can show both contentment and anger. A computer program also gives it the instinct for companionship

The game and performance modes allow the owner to send commands to Aibo via remote control In this mode Aibo can also perform any of over 100 different tricks or special movements and carry out any custom movements designed by the owner.

Sony is also selling (for an additional US$450) a software application that allows owners to program new tricks and movements on a personal computer. The instructions are transferred to a Memory Stick, Sony's proprietary memory card system, which is inserted into Aibo, giving it access to the new movements.

Aibo is based on a 64-bit RISC microprocessor, comes with 16 MB of main memory and runs on Sony's Apetios real time operating system Sensors include those for touch, a range finder stereo audio, acceleration and angular velocity The rechargeable lithium ion battery will last around 1 5 hours when Aibo is in autonomous mode



A drawing of Sony's robot dog, Aibo.

Aibo carries a price of US$2 500 in North America and is about US$450 cheaper in Japan Despite the hefty price tag, however, the 3 000 Aibo units earmarked for Japanese residents were snapped up in 20 minutes when they went on sale at the beginning of June

However, if you're in the market for a chip-based canine, about half of the 2,000 units reserved for U.S. customers are still available, according to a Sony representative in the U.S Sony is selling Aibo exclusively through tha internet. ❑

Aibo, http://www.sony.co.jp/robot

Digital TV expected to spur sales of PCs more than TVs

MENLO PARK, Calif (NB)—The growing presence of digital television will heartily boost the sale of video-enabled computers while causing the market for TV sets to erode slightly, according to a new report on digital TV trends

As standard digital television (SDTV) becomes increasingly available between 2002 and 2004, more viewers will swap their 27 inch to 32-inch TV sets for more moderately priced widescreen SDTV sets, while smaller sets will be replaced by video PCs and Internet appliances, predicts the report from McLaughlin Consulting Group, a marketing and technology services firm made up of electronic-display professionals

The forecast doesn't bode well for the super-sharp high definition television programming known as HDTV, as more people are expected to choose PC monitors that offer HDTV programming as well as Internet video content over big screen HDTVs.

"We found that HDTV alone will not dramatically shift the price point for TVs to a much higher price," said Chuck McLaughlin, co-author of the report. "People are backing away from HDTV [as a stand-alone entity] as the business model moves toward multicasting," McLaughlin said

One of the biggest drawbacks cited about digital television has been the price. HDTV sets currently on the market average US$7,000 or higher. A survey by the Yankee Group found viewers will pay no more than US$474 for digital TV

"The hard reality of consumer behavior is people don't spend a lot of time or money shopping for a TV with a big picture," McLaughlin said The report is based on interviews with about 150 players in the retail, telecommunications, entertainment, computer and consumer product industries, as well as secondary research ❑

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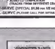

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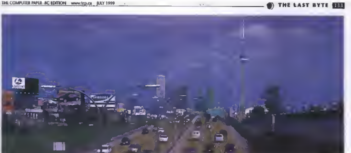

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World famous in Canada

There's a new reason for COOT (Canada Outside Of Toronto) to hate Hogtown: the Greater Toronto Area really is a 'world class' high-tech centre—for now, anyway

By Jeff Evans

According to a recent survey of major technology centres in North America by some measures Toronto and its surrounding region of suburban sprawl hides a big secret the Greater Toronto Area (GTA) may be the third most significant technology centre in North America Silicon Valley in the San Francisco Bay region of California is, of course, the first.

This recent finding about Toronto, if true is significant for a couple of reasons. First it indicates that we Canadians continue to be very modest about our achievements—to the extent of not even noticing them. Second, just as we begin to sense Toronto's quiet achievement there are indications that its invisible golden age may be threatened.

For the past couple of years, Toronto has enjoyed a sustained economic boom that only came after an equally sustained economic recession "New economy" sectors, including high tech entertainment, financial services and tourism, have contributed mightily to that boom. Toronto needs some fat years to try to make up for the lingering debt, cutbacks and unemployment associated with the 1992 recession

A successful Toronto is also good news for the rest of Canada, since the GTA generates a disproportionate amount of the export and tax revenues that help propel the nation's economy and fund its social programs. There are more than 3 400 technology firms in the GTA, including thousands of Canadian firms of all sizes and hundreds of Canadian head offices of multinational (mostly American) firms.

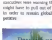
Gone global

Much to the annoyance of the 26 million Canadians who don't live in the GTA, Toronto's legendary collective opinion of itself as the centre of the universe now has more legitimacy at least in the Canadian technology field. The reasons for this are many It has a concentration of high-quality universities a deep pool of highly skilled technical professionals excellent transportation and telecom infrastructure proximity to the eastern and central U.S markets, job opportunities for skilled migrants from COOT and abroad, and many more.

To be fair, Toronto has also had the luck of becoming the technology metropolis of Canada somewhat by default. Montreal was Canada's original cosmopolitan centre, but the last 30 years of debate over Quebec's future have stymied its economy and growth and it appears incapable of catching up. No matter what the outcome of the separatism/sovereignty issue, it seems very unlikely that Montreal will ever again be more than a regional centre of modest significance in continental high-tech terms

Similarly, the pockets of technological activity in other regional centres, such as Vancouver, Calgary Ottawa and Halifax, will find it hard to gain the critical mass to challenge Toronto, much less Silicon Valley, New York, Los Angeles, Boston and other North American centres. Even the Kitchener/ Waterloo area west of Toronto, a hotbed of high tech activity tends to act as a super suburb of Toronto more than an independent entity

The most ironic aspect of the recent survey however, was that at the exact same time it was released, some of Canada's top technology executives were warning that they might have to pull out of Canada in order to remain globally competitive



Pay up or I'll shoot these jobs

Don't tax me, don't tax thee, tax that man behind the tree

On April 27, John Roth, the chief executive officer of Northern Telecom (Nortel), one of the few truly global Canadian brand names, joined a chorus of senior Canadian business executives claiming that high federal and provincial taxes and other "business unfriendly" policies were putting pressure on Canadian technology firms to leave this country

Whenever Canadian businesses claim government policies are forcing them to look outside Canada to make investments, a natural suspicion is that this unhappiness stems from a desire for preferential tax breaks, grants, and other lucrative favors All over the world hugely profitable companies squeeze favors out of governments as a form of economic extortion. "Pay up or I ll shoot these jobs," would be one way to characterize this strategy

Unfortunately, in a global economy full of governments ravenous for job-creating private investment, this tactic increasingly works like a charm for multinationals playing hardball. However, it's not all a simple case of corporate welfare bums at the trough. According to Roth, it isn't just corporations and money that flit around the world. It's also highly talented individuals.

Leading-edge technology companies are absolutely dependent on that rarest of natural resources—exceptionally creative human thoughts According to Roth, Nortel loses up to 500 engineers each year to U S competitors, largely for economic reasons—the pay there is better and taxes lower.

The IPO frenzy

Once again there is a mix of media spin and truth in this argument. While it's true that a world class nerd can often command a higher salary and pay lower taxes in the U.S , it's also true that among the breaks business leaders are demanding are tax exemptions on stock options. These extra financial incentives usually benefit senior executives or shareholders, much more than the actual creative talent.

Established companies often do more to drive away their bright young minds than any of the government policies they criticize. One of the biggest incentives for a crackerjack programmer or engineer to leave Nortel for, say an Internet startup company is that a little leading-edge company may be willing to offer equity in the form of stock to the new employee when the company "goes public" with its initial public offering (IPO) of stock. Bigger, stodgier companies, run by accountants and lawyers, look coldly on sharing ownership with "the hired help " In fact, they are much more likely to downsize and cut back.

Big fish eat little fish

There is only a relative handful of Canadian companies such as Nortel that have become players on a world scale while retaining a strong Canadian identity it's much more common for Canadian technology companies to eagerly sell out to a larger company (usually American) when they reach a certain size and level of success Former Canadian technology superstars such as Delrina, Alias, Softimage and Discreet Logic all cashed out when offered a deal they couldn't refuse from a U.S giant

Toronto is doing something right as far as offering an environment for the creation of world-beating new technology It would be better to rationally try to understand how that success has been achieved, before we either see it slip away, or futilely throw money at companies blaming their troubles on the government and trying to dodge their responsibilities as corporate citizens ❑

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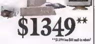

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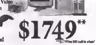

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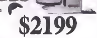

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